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Uses Electric Furnace in Malleable Foundry

Air Furnaces Eliminated in Notable New Plant of National Malleable Castings Co., Which Will Employ the Kranz Triplex Process

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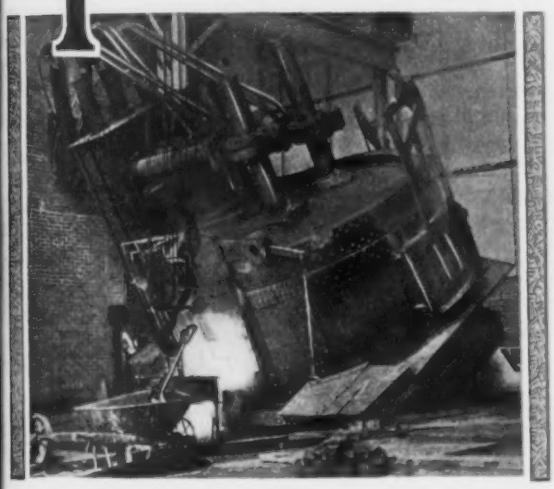
THE new Cleveland plant of the National Malleable Castings Co. marks a new step in foundry construction and has numerous notable operating features representing radical departures in



foundry practice. It is rated as the largest foundry in the country and is designed for making castings by the Kranz triplex process which eliminates the air furnace, and in which the electric furnace and Bessemer converter are used for refining purposes. The process provides with the use of cupolas, converters and electric furnaces, a flexibility of operations that will permit the plant to be changed over in a day from a malleable foundry to a steel foundry, and vice versa. The Kranz triplex process was developed and patented by W. G. Kranz, vice-president of the company.

Because of the plant's flexibility, the equipment plans during construction were temporarily materially changed to meet the exigencies of the war. Originally designed as a malleable foundry to replace the company's old Cleveland plant and provide a much greater capacity, the needs of the Government for cast steel anchor chain resulted in placing one unit of the plant in operation for the making of anchor chain. This was done before much of the equipment required for the malleable foundry operation had been installed. The remainder of the plant was being equipped for making anchor chain, but this work was suspended after the armistice was signed. The manufacture of chain will be continued indefinitely in one unit and the other units are now being equipped for making malleable castings. It is expected that the malleable foundries will be ready for operation in April.

The plant occupies a 32-acre site at Quincy Avenue and Woodhill Road, adjoining the Cleveland Belt Line Railroad. The buildings are of brick, steel and concrete construction of the most substantial character. The windows throughout are of factory ribbed glass set in steel sash. The fire risk is so low, because practically no wood is used in the construction, that no insurance is carried on any of the buildings.

The main foundry building, in which all the producing departments for making castings are contained, is an irregularly shaped structure approximately 575 x 725 ft., and providing approximately 10 acres of floor space. The building is of steel frame construction with brick outer walls, and has the Aiken type roof covered with cement slabs. It is 35 ft. in height and designed to insure the best possible conditions of light and ventilation.

The structure is divided into bays or aisles in which the various departments are located. The accompanying drawing shows the general layout of the plant. On the west side is a storage department 75 x 575 ft. Adjoining the storage department at about the center is the melting room, 125 ft. square, and with an additional space, 50 x 125 ft., available in the storage bay. On either side of the melting room at right angles to the storage department are four bays or molding floors, each 75 x 375 ft. These molding floors will be known as foundries Nos. 1, 2, 3 and 4, and the plant is arranged for operation by units. In case business does not warrant the operation of the entire plant, one or more of the foundries will be run, and it is stated that with the exception of carrying the entire overhead, one of these complete foundry units can be operated as economically as all four. As stated above, one of the foundries is now used for making cast steel chain.

The cupola department is located near the southwest corner of the building adjoining the melting stock storage bins, the pouring platform extending into the storage bay. At the front of the cupolas is the annealing pot foundry, 150 ft. long and 75 ft. wide, which is served by a 10-ton electric traveling crane. Between foundries Nos. 2 and 3 beyond the melting department is located the core room, 125 x 175 ft., with concrete floor, and under this room is a basement 125 ft. square for the storage of coke, firing of coke ovens, storage and mixing of sand, etc. Adjoining the core department

and almost in the center of the building is a four-story structure to be used for the storage of molding machines, flasks, boards and various foundry supplies. This structure is built of concrete, is 75 x 125 ft. in dimensions and provides about an acre of floor space. It is enclosed only by railings around the outside and has an elevator and two stairways. Between each side of the core room and the adjoining foundry bays are aisles 25 ft. wide, which provide room for the erection of stacks that cannot be located in other parts of the plant because of the crane runways, and for such other uses as may be required. Above one of these aisles a mezzanine floor, 175 x 25 ft., is at present used as a restaurant, but later will be occupied as a girls' core room.

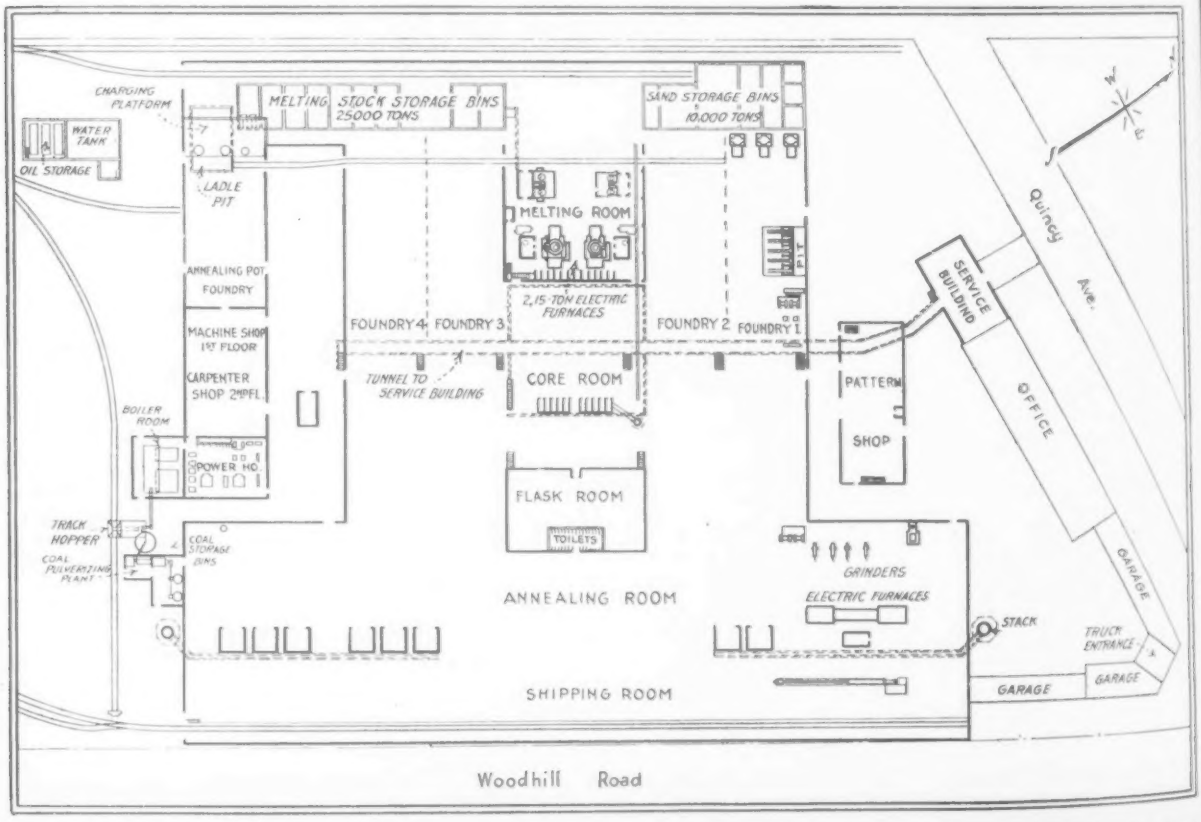
On the east side, at right angles to the foundries, is the annealing department, 100 x 725 ft. The finishing and shipping bay is at the extreme eastern side of the building adjoining the annealing department, and occupies a floor space 75 x 725 ft. A depressed loading track extends the entire length of this department, providing trackage for 18 cars. This track parallels the receiving track in a storage bay on the opposite side of the foundry building. The entire plant has been designed and the departments are so arranged that every successive step in the production of castings is a logical sequence of operations, with the material passing through the shop in the same direction.

One of the interesting features of the plant is an underground tunnel, 600 ft. long, that extends from the service building, which is the works entrance, to the far side of the plant, running under the center of the main building. This tunnel is 10 ft. wide and 9 ft. high, and from it stairways connect to the foundry floors and various departments. The tunnel has proved a great convenience for men going to and from work, saves time in going from one part of the plant to another, and is also regarded as of the highest value as a safety first provision.

In the storage bay, a receiving track with a capacity of 12 to 15 cars, extends along the side wall the full length of the bay, and adjoining this track are rows of storage bins, those for sand being at one end and those for pig iron, scrap, etc., toward the other end, and the coke bins being near the center. The land where the storage bay is located was originally 16 ft. below the present floor level. Consequently excavating was not required in locating the bins, which extend 7 ft. above and 12 ft. below the present floor level. Storage capacity is provided for 20,000 to 25,000 tons of pig iron and scrap, 10,000 tons of sand and 3500 tons of coke, in addition to other supplies. The storage bay is served by two 10-ton cranes, the crane rail being 30 ft. above the floor. Pig iron and scrap are unloaded with electric magnets which are also used in handling the metal from the bins to the cupola charging cars. All cranes are of the Pawling & Harnischfeger make, and the crane equipment throughout is limited to four different types and sizes, reducing as far as practical the number of types so that fewer spare parts have to be carried.

Along the east side of the bins nearly on a level with the top of the bins and 8 ft. 6 in. above the foundry floor level is a platform 12 ft. wide and 225 ft. long, extending from beneath the charging platform to the melting department. Two narrow gage tracks are provided on this platform for hauling material to the charging floor. Cupola charging cars of a special hopper type with a capacity of 2500 lb. run on these tracks. The hoppers are hinged on the front side and are discharged into the cupolas by raising a bale attached to the back side with an air hoist. Stock is weighed in the charging cars on track scales located near the charging platform. As the capacity of each bin is known, when the bin is emptied an accurate inventory of the stock consumed is provided, and this always serves as a check on the weights of the material that is taken either to the cupolas or electric furnaces.

The cupola platform is 75 ft. long, 37½ ft. wide



Plan of the National Malleable Castings Co.'s Plant at Cleveland. The Kranz triplex process provides for changing over in a day from a malleable to a steel foundry

Foundry No. 1, Looking Toward the Transverse Bay in which Pig Iron, Scrap, Sand, etc., Are Stored. The illustration shows the general type of construction including the type of partition that separates the foundry bays. The bay shown is used for making cast steel anchor chain. After the alternate pre-cast links are made, they are placed in the long molds on 100 ft. concrete runways shown at the left, and molds are made for the connecting links of the chain, which is cast in 90 ft. lengths. Instead of following the usual practice of pouring the metal from the bull ladle the shots are poured directly from a 3-ton or larger ladle

nd 22 ft. high above the floor level. It is of steel nstruction and has reinforced concrete slab floors vered with wood blocks. One of the cranes in e storage bay is used to handle the charging cars tween the narrow gage tracks and the charging atform. However, a car haul will be installed to lieve the crane service. Loaded cars on being ised to the charging platform are placed on tracks rectly in line with the tracks below. Turn tables re provided in the tracks so that charging cars are ushed back to the cupolas and then onto transerse tracks at each side of the cupolas. In charging the cupolas, one car is charged at one side and ne at the other side, so that the cupola charged is ways kept level. The design in operation of the upolas is a departure from the regular foundry ractice. The cupolas in general design are simiar to those used in Bessemer steel plants, and the essemer practice of continuous operation is fol-wed.

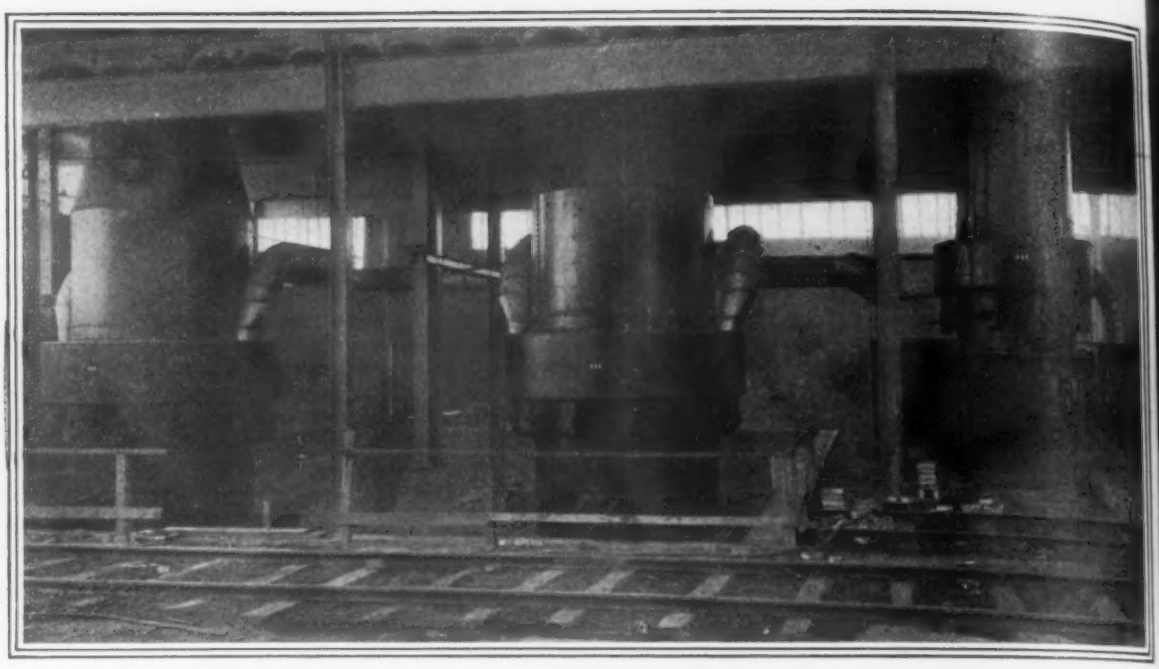
There are two very large thick lined cupolas. hese are 108 in. in diameter and taper down to 2 in. at the charging floor. They are lined down 56 in. at the melting zone, having a bell-shaped ning 26 in. in thickness above the tuyeres, and apering down to about 13 in. at the base plate. hey are 65 ft. high from the bottom of 6-ft. 6-in. olumns and 27 ft. 6 in. in height from the chargng floor to the tapping spout.

The cupola has 12 tuyeres of 6 in. diameter. It equipped with a rectangular wind box to which re bolted on the under side 12 tuyere castings. hese castings are provided with peep holes directly pposite the tuyere and cleanout holes on the under ide of the castings. The wind box is 11 ft. 6 in. diameter outside, 9 ft. inside and 3 ft. deep. he blast is supplied by two No. 5½ Root positive ressure blowers, the blast pipes being so arranged hat either one or the other may be used. The harging doors are the straight open door type used n connection with mechanical charging and have teel plate chutes on the lower side of the doors.

The capacity of these cupolas with a lining of the usual thickness would be approximately 25 tons per hour each, but with a thick lining it is reduced to 12½ tons per hour each. One cupola operating 24 hr. per day will supply the normal requirements of the plant, 300 tons of molten metal, which, figured on the basis of a 50 per cent yield on the melt will produce 150 tons of finished castings per day. One cupola will be kept in continuous operation for a full week and then will be relined while the other is used. In addition to the two large cupolas, there is a 63-in. standard foundry type cupola for reducing iron for annealing pots. The cupolas were built by the Whiting Foundry Equipment Co., which also supplied the hot metal ladles.

The cupolas stand in a concrete pit 10 ft. deep in order to get a greater height from the level of the tuyeres to the charging doors. This permits the charging of a larger quantity of material in the cupolas and allows the increased charge to be heated by the waste gasses from the melting zone. The cupola pit is 50 x 75 ft. The ladles of metal will be lifted from the pit to a ladle car with the pot foundry crane, which will also serve to handle the slag to be run into a 4-ton slag ladle buggy. The hot metal ladle car runs on a standard gage track that extends from in front of the cupolas to the melting department. The metal will be weighed on the way from the cupola to the melting department and again before going from the melting department to the foundry. By weighing the metal both after it comes from the cupola and after refining, a record is kept of the loss through oxidation both in the cupola and in the melting department.

The Kranz triplex process is designed to overcome the difficulties resulting from the presence of relatively high carbon and also in some cases a relatively high manganese and silicon in iron. In usual practice, two tons of metal will be tapped from the cupola into a small ladle and conveyed to the melting room on a storage battery operated ladle car. This metal will be charged into one of the



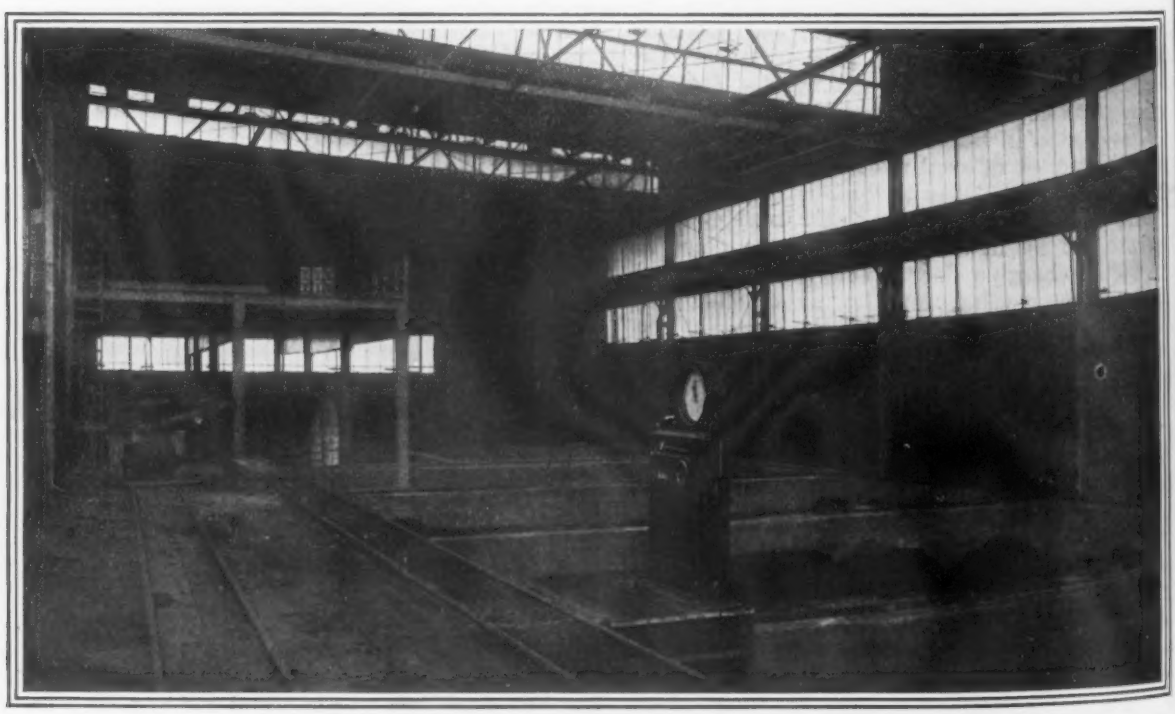
The Thick Lined Cupolas 108 in. in Diameter, Taper Down to 72 in. at the Charging Floor and Are Built for Continuous Operation. They are located in a pit 10 ft. deep which permits a similar decrease in the height of the charging floor without decreasing the cupola capacity

Bessemer converters and blown down to soft steel, the carbon, manganese and silicon being wholly or partially blown out. While the charge is being blown in the converter, the cupola will be tapped several times into a 15-ton ladle until the ladle contains 10 tons. This ladle of metal is then taken to the melting room, the blow in the converter is finished and the 2 tons of treated metal is dumped from the converter into the ladle of cupola iron. Then the resultant mixture with the reduced carbon content as well as reduction in the percentage of manganese and silicon is charged into the electric furnace for further refinement, after which it is ready to be cast.

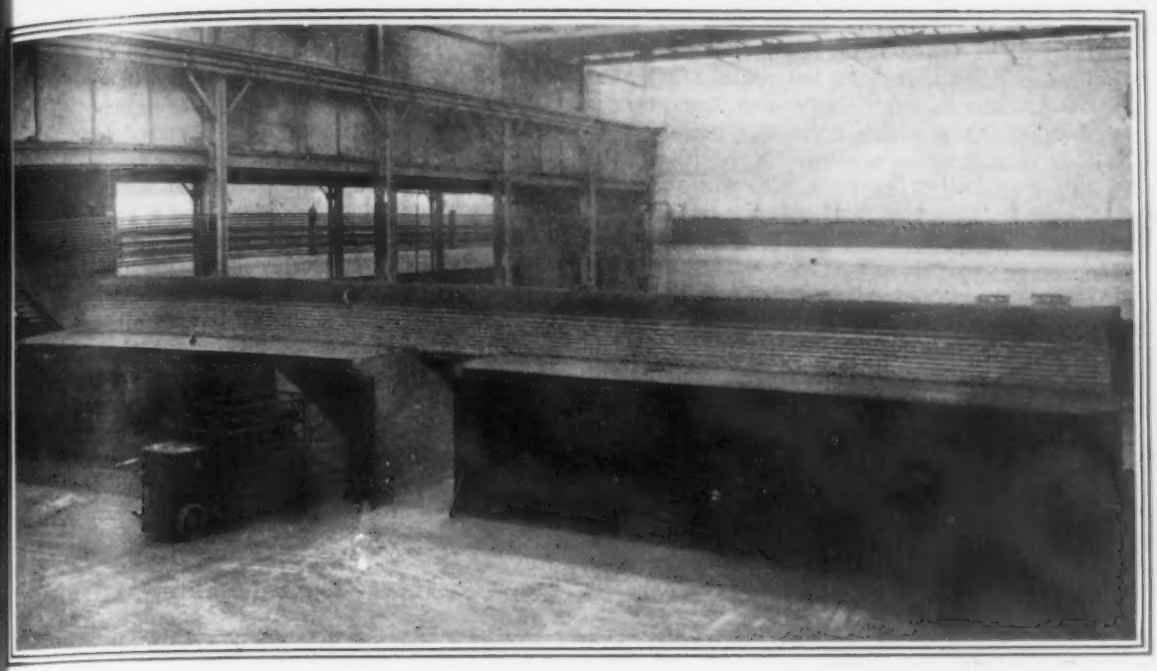
The melting room is equipped with two 2-ton and two 6-ton side blow converters and two 15-ton Heroult electric furnaces. The smaller converters will be used for the triplex process for malleable iron and the 6-ton converters for producing low carbon Bessemer steel for charging the electric furnaces when producing electric steel for castings.

In the manufacture of cast steel anchor chain the cold metal is melted in the electric furnaces. Four or five heats are tapped per day, the heats running about 12 tons. Under normal malleable operations with the triplex process, about 15 heats will be tapped from each furnace per day during the continuous period of 24 hr. of operation.

The Heroult furnaces have copper tubes for conductors through which the cooling water from a 3000 kva. transformer flows in order to maintain a low temperature in the copper tubes. It is stated that this design of conductors effected a saving of two-thirds of the copper that would have been re-



The Storage Department Showing the Large Concrete Bins 7 ft. Above the Foundry Floor for the Storage of Pig Iron, Scrap, etc. To the platform on which material is conveyed to the charging floor, charging cars of the hopper type are raised by one of the overhead cranes

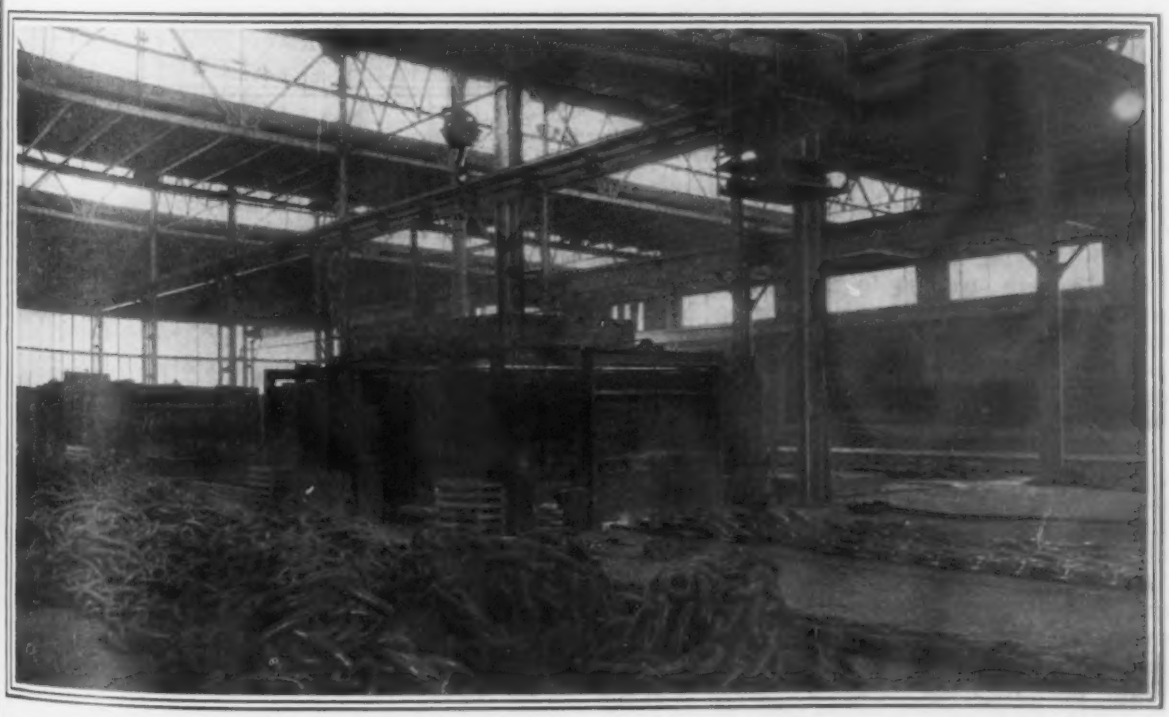


The Core Ovens Are Arranged in Two Batteries of Five Ovens, Each at the Center of the Core Room. These are double end ovens, being charged from each end. A brick flue connects the tops of the ovens to a stack through a breaching. The ovens are either coke or oil fired from the basement

ired had the usual bus bar arrangement been ed. Otherwise the construction of the furnaces llows the standard Héroult design. The transrmers are located in substations back of the furaces. The copper section of the cables, 30 in numer, is equivalent to a round bar 8 in. in diameter nd weighing 200 lb. per lineal foot. The furnace hell is 13 ft. 6 in. in diameter, and the graphite ectrodes are 12 in. in diameter. Tilting is acomplished by motor-driven tilting gears. Small oncrete storage bins are provided near the electric rnaces for the furnace supplies. The melting oom, which is enclosed, is served by a 20-ton crane ith a 5-ton auxiliary, the crane runway being 30 . above the floor. The chemical laboratory is loated in the neighborhood of the melting departent over the core room.

The foundry floors are each served by two 15-ton cranes with 3-ton auxiliary, the crane runways being 24 ft. above the floor. At the upper end of the first bay, adjoining the sand bins in the storage bay, are auxiliary bins and sand mixing machines from which sand is supplied to all of the molding floors.

The foundry floors and core room are separated by concrete division walls, 6 ft. 8 in. high and 10 in. thick, extending between the building columns. With these low partitions, the upper part of the building is left clear and open for the distribution of light and the circulation of air. Alongside of the division walls, molders' stalls 10 ft. wide, will be built in the malleable department, providing each molder a floor space 10 x 35 ft. Molding machines will be installed as required.



Chain Is Heat Treated in Two Electric Furnaces of the Baily Type, One of 600 kw. Heating for Hardening, and the Other a 200-kw. Furnace for Drawing, a Quenching Tank being Located Between the Two Units. Electrically operated winches are used for drawing the shot of chain through the furnaces, two shot at a time looped into 29 ft. lengths

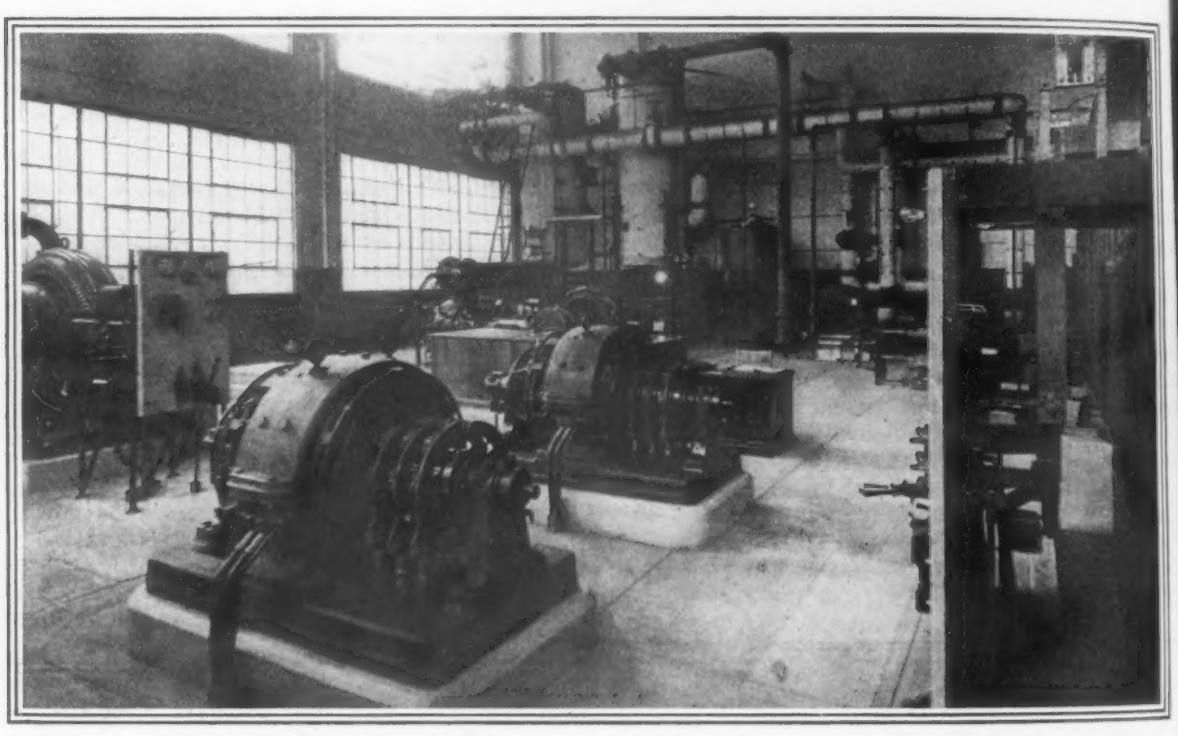
Each unit will accommodate 70 molders per turn. Hot metal will be taken from the melting room in 6-ton ladles, carried along the hot metal track that runs between the foundry bays and the storage bay, and taken by a crane from the ladle car to the unit in which it is needed. Here it will be poured into bull ladles for distribution around the foundry. Sand from the sand mixing department will be delivered to the molding floors in a similar manner.

The core oven equipment includes two batteries of double-end ovens, five ovens in each battery, 5 ft. wide, 15 ft. long and 7 ft. wide inside. Each chamber accommodates two core racks, which will be handled in and out of the ovens on elevating platform storage battery trucks. The ovens are either coke or oil fired from the basement. The oven doors are 1½ in. thick and are made of two plates with an insulation between of powdered kiesel-guhr. The gases from the ovens are taken from the top by a brick flue which is connected to the stack by breaching. The chimney is 4 ft. in diameter and 75 ft. high. A monorail extends in a straight line from the storage bay through the core room for bringing in sand, coke, etc., these being dumped through openings in the floor to the basement. The castings, after being shaken from the molds will be carried by crane to the end of the bay adjoining the annealing department. Along the foundry side of the annealing department, each foundry will have a battery of 20 and 28-in. x 56-in. tumbling barrels driven in groups of eight each. These will be used for hard rolling. By having these separate hard rolling units for each foundry the transferring of castings from one foundry to another is entirely eliminated.

There are two batteries, each of three annealing ovens, at one end of the annealing room and two ovens at the opposite end where the space is partly occupied at present by heating furnaces. The plan, however, provides space for seven ovens at each end on one side and five ovens facing these on the opposite side, making 12 annealing ovens at each end with a common system of flues and connected with one chimney, 7 ft. 6 in. in diameter and 150 ft. i height. The annealing ovens are 20 ft. 6 in. wid and 25 ft. deep inside, and each will accommodat 40 tons of castings of an average class. The sid walls, roofs and doors are insulated with at leas 4½ in. of Sil-O-Cel brick. Each oven is fired wit four burners fed with powdered coal. The oven will be charged with steam and electric trucks Sufficient space is left back of the ovens for th final operations of soft rolling, grinding and sand blasting. From here the finished castings pass o to the storage and shipping bay adjoining.

The manufacture of electric steel anchor chai in the first foundry floor necessitated the installa tion of some equipment specially required for tha work. The method of making this chain was de scribed in a paper prepared by Chester K. Brooks assistant manager of the foundry, and presented a the last annual meeting of the American Society o Testing Materials and published in THE IRON AGE July 4, 1918. Toward the front of the first bay are located five standard core ovens for making large cores or one-half lug sections used in the molding of steel chain. The chain links after being cast in sand molds are rolled in Sly tumbling barrels and these pre-cast links are made into continuous lengths 90 ft. long or a shot of chain by molding and casting links connecting the pre-cast links. Chain is made in only one size, 2½ in. in diameter. After the shot of chain is cast, it is rolled in a battery of 48 x 60-in. and 36 x 60-in. Sly tumbling barrels located at the lower end of the bay, and the chain is then ground on four swinging frame grinders located at the end of the bay on one side of the annealing room.

After being ground, the chain is heat treated in a set of 900-kw. electric heat treating furnaces of the Baily type, built by the Electric Furnace Co., and having a capacity of 50 tons per day. The set includes two furnaces and a quenching tank. The chain is subjected to a high temperature in the first furnace for hardening, then quenched in water, and then tempered in the second furnace. The furnaces are 28 ft. long and 15 ft. wide, and the quenching



View From the Switchboard End of the Power Plant Showing the Electrical Equipment, One Air Compressor and in the Rear the Heaters and Circulating Pump for the Heating System

ank between the two units is 10 x 40 ft., the set cluding the space taken for entering the furnaces, overing a floor space approximately 175 ft. in ngth. For the heat treating operations, the chain looped into four sections about 20 ft. long and wo shot of chain pass through the furnaces at a ime. The loops are attached to hooks and the chain pulled through the furnaces by electric operated inches, the first winch drawing the chain into the irst furnace and then into the quenching tank, and he second drawing it into the second furnace and hen out on the floor for cooling. After heat treating, the chain is tested by means of two 3000-lb. tandard drop testing machines and a 700,000-lb. orizontal pull testing machine.

The coal supply comes to one unloading hopper t the south end of the plant near the end of the nnealing room. After being discharged into the opper under the track, it is taken by an apron onveyor and fed to one of two elevators. One levator feeds a 16-in. screw conveyor which carries the fuel to the boiler room bunkers. The other upplies a circular storage bin of 250-ton capacity n connection with the coal pulverizing equipment. In the pulverizer house is a Manitowoc coal dryer, the necessary conveyor and elevating equipment, and two Raymond impact pulverizers of the high type. From a Cyclone collector on the annealing building roof, 12-in. screw conveyors carry the pulverized coal to storage bins over the annealing furnaces. The pulverizers have a capacity of 3 to 7 tons each, depending on the fineness of the pulverized fuel.

The boiler house and power plant at the south end of the foundry occupy a brick and steel building, 55 x 125 ft., and 40 ft. high. Electric current is supplied by the Cleveland Electric Illuminating Co., being delivered to the power house at 11,000 volts in three cables, each with a capacity of 3500 kw. The current is distributed through a high-tension switchboard, 37 ft. long and 18 ft. high, to the electric melting furnaces, heat-treating furnaces, and to a bank of transformers in the power room that supply current to two 300-kw. rotary converters that furnish direct current at 230 volts to the power circuit for the operation of cranes, and to another bank furnishing alternating current at 440 volts to take care of the blowing and cleaning equipment and other power requirements, and also for the lighting circuit. The work's distribution board for all direct and alternating current and for lights is 38 ft. long and 7½ ft. high. The board is so designed and wired that current used in every department or separate operation in the works can be metered in order to take care of any accounting that may be required. The power lines throughout the plant are carried in underground conduits.

The compressor equipment located in the power room includes an Ingersoll-Rand compressor with a capacity of 1800 cu. ft. of free air per min. at 30 lb. pressure, driven by a 150-hp. synchronous motor for sand blast work and a high-pressure compressor of 1100-cu. ft. capacity, direct connected to a 225-hp. motor. The compressor furnishes air for the molding machines, vibrators, and for fuel oil burners for heating the core ovens and drying the ladles.

Along one side of the power house next to the boiler room are heaters and circulating pumps for the hot water heating system which takes care of all the buildings. The boiler room is equipped with three Connelly 340-hp. water tube boilers that supply the heating system. The boilers are equipped with Murphy stokers which are coal fired from overhead bunkers. The ashes are ejected from the ash pit by an 8-in. steam ash conveyor to a pit outside of the building, from which they are loaded on cars and used for filling purposes.

The heating system takes care of approximately 150,000 sq. ft. of radiation, or sufficient to heat 400 average-sized residences. In the main building all the radiation is made up of pipe coils composed of 1½-in. pipe, and in this building alone there is approximately 50 miles of this one size of pipe.

The machine and carpenter shops occupy a two-story building, 75 x 120 ft., between the pot foundry and the power house, the machine shop being on the first floor and the carpenter shop on the second floor. Lubricating oils are kept in a building 28 x 30 ft. located in an open court between the machine shop and main building.

The pattern shop occupies a three-story building, 60 x 150 ft., on the first floor of which are the shop operating and engineering department offices and pattern storage department. The second floor is used for the making of anchor chain and malleable patterns. On the third floor is the coupler pattern shop and the general pattern shop for the Sharon and Melrose Park works and an exhibit room. Both the second and third floors have small foundries for making white metal and brass castings for metal patterns. There is a stairway and elevator at each end of the building, which has a monitor roof. The first floor has a wood block floor, and floors of this type are used in some other departments where they are found desirable. The annealing department and final finishing and shipping departments will both have wood block floors.

The service building, a three-story brick structure, 50 x 90 ft., through which the men enter the plant by means of the underground tunnel from the time lobby, is designed primarily for the service of the employees, and contains the dispensary, locker rooms, lavatories, shower baths and drying room on the first floor, locker room and a separate room for foremen, with lockers, showers and lavatory and toilet facilities on the second floor. The entire third floor will be used for a club room for the men, furnishing them attractive quarters and providing a room for meetings. A large general office building, which has not yet been built, will adjoin the service building. More than the usual attention was given to the toilet facilities. These are provided in the foundries and various other departments, and equipment and fixtures of the most modern and sanitary type are used. The wash stands for the men are white enamel troughs, and hot and cold water is supplied through goose-neck spray heads.

Simon-Carves Ltd., Manchester, England, whose New York office, 2 Rector Street, is in charge of W. E. Shelley, American representative, has received an order for the coke ovens, coal and coke-handling plant, and also a sulphuric acid plant, which will be erected in connection with the blast furnace plant to be built in India by the Indian Iron & Steel Co., Ltd., as mentioned in THE IRON AGE last week. Simon-Carves, Ltd., is the pioneer of the by-product coke industry in England and still is the largest builder of that class of equipment in the United Kingdom. It was the first to erect a by-product plant in India, and the one mentioned above is the seventh battery to be erected by that company in India.

The plant of the Reznor Mfg. Co., Mercer, Pa., manufacturer of the Reznor gas heaters, has been put in operation, after being closed for about a month for repairs and extensions. More machinery and floor space were added, as well as a large stock-room. The company sold over 100,000 gas heaters during the 1918 season, a number of these being purchased by the Government for its plant at Nitro, W. Va.

NEW RECORD FOR EXPORTS

January Makes Remarkable Showing—More War Restrictions Removed

WASHINGTON, Feb. 25.—Despite restrictions and embargoes, to say nothing of shipping difficulties and the demoralization of foreign markets, January exports of the United States broke all records. Statistics compiled by the Bureau of Foreign and Domestic Commerce reveal the fact that the value of the January exports reached a figure never before touched by any monthly figure in the history of American commerce.

The total exports for that month were $623,000 000, against $566,000,000 for December, 1918—an increase of $57,000,000—and an increase of $118,000,000 over the January, 1918, figures, which totaled $505,000,000. Only twice before have the monthly export figures reached the $600,000 000 mark—in January and December, 1917.

During the seven months of the fiscal year ending with January, 1919, the exports totaled $3,798,000,000 against $3,450,000,000 for the corresponding period of the previous year.

The value of the January imports was $213,000,000, an increase of only $2,000,000 over the December figures and a drop of $21 000,000 from the January, 1918, total of $234,000,000. For the seven month period, the total imports are $1,698,000,000 against $1,634,000,000 for the same period of last year.

The January excess of exports over imports also broke all records. It was $410,000,000—almost the equivalent of our total favorable trade balance of the last normal year—1914—which aggregated only $470,-000,000.

Removing War Restrictions

The most important removal of war restrictions on our commerce during the last week was the announcement by the War Trade Board that trade has been resumed with that portion of the Rhine provinces of Germany included within the area of military occupation by the American and Allied armies. The definite announcement of the methods of procedure by which exports to and imports from this territory will be governed has not been made. In the meantime, however, says an announcement by the board, persons desiring to engage in trade with that territory, may communicate with the War Trade Board here.

As the territory thus opened up includes some of the most important industrial centers of the former German Empire, it promises to be a big item in our commercial development, especially as it is likely that access to this territory may be provided direct through the mouth of the Rhine in Holland, instead of by the roundabout course through France.

Trade with the former German colonies also has been re-opened. The latter authorization says a statement by the War Trade Board, permits all persons in the United States, subject to the rules and regulations of the board, to trade and to communicate with persons residing in colonies which were owned or controlled by Germany on Aug. 1, 1914. This extensive authorization includes the areas in Africa known as German East Africa, German Southwest Africa, and Kamerun. It also includes Kiauchau in Asia and the Bismarck Archipelago, the Caroline Islands, the Solomon Islands, the Marshall Islands and German Samoa in the Pacific. In opening all these colonies to the resumption of trade, the War Trade Board declared that applications hereafter will be favorably considered for licenses to export or to import all commodities to and from such territories.

Despite the program to re-open the occupied portions of Germany, there is still a hitch in the question of renewing full commercial relations with the Grand Duchy of Luxembourg, although commercial communications are being permitted.

The Australian government has revoked the ban on the importation of certain articles of tinplate and goods packed in tinplate containers.

Market for Iron Pipe

The Far Eastern Division of the Bureau of Foreign and Domestic Commerce has prepared an interesting report on the possibilities of establishing an export market for iron pipe from the United States in Asia.

"There is perhaps one consideration which outweighs all others," says the report, "in gaging the market for iron pipe in the Far East and that is the entire absence of modern sewerage systems. The densely populated countries of the Far East, Japan and China, have for years depended upon a sufficient return of the night soil to the land to prevent its deterioration and for this reason our modern systems of sewage disposal are not likely to be introduced, especially as the cities obtain a revenue from the removers of this waste material who in turn sell it to the farmers in the neighboring districts.

"Waterworks and gas works on a modern scale, however, are now established in the chief cities of the Orient and the demand for iron pipes for these purposes is likely to increase. There will never be the general use of gas in the Orient that there is in the United States, however, because of the lack of coal in Japan and the tendency to adopt electricity in Japan and China for lighting purposes. There has been a very great demand in Japan for boiler tubes for the purpose of fitting out marine boilers and because of the recent growth of manufacturing and the demand for boilers in industry. The Nippon Kokkan Co. specializes in the manufacture of iron pipe.

There is a growing market in the Dutch East Indies for iron pipe and here the comparatively large European population, 125,000, is constantly demanding more modern drainage and sewerage facilities. The same considerations regarding night soil do not prevail here where the tropical soil is not in need of intensive methods of agriculture, crop rotation sufficing. The same is true of India and the English have done very extensive work in introducing modern sanitary methods.

The Temporary Loss of British Trade

When the British government announced that the import restrictions which had been lifted after the armistice were to be resumed March 1 an inquiry was begun by the American Manufacturers' Export Association to determine what effect this would have upon the export situation. The result of this inquiry is summarized in a statement issued by George Ed. Smith, president of the association and president of the Royal Typewriter Co.

"The American manufacturer," he said, "realizes that England is under the necessity of readjusting her domestic affairs. It is true that this readjustment will work considerable hardship on American firms which have a large investment in Great Britain and which cannot supply their English branches with stocks for some time to come. On the other hand, it does not mean that the American manufacturer must abandon his English branches, because we are assured that within six months or at most a year England will once more resume importation upon normal lines. Prior to the war we were England's best customer and she was ours. Excluding the raw materials exported from the United States to Great Britain, the total manufactured exports from us to England and from England to us were approximately the same. We need English markets and England needs American markets, and it is not likely that England would seek to delay longer than necessary the resumption of a mutually beneficial trade.

"Realizing that he himself may need special measures to assist his own business back to normal conditions, the American manufacturer is inclined to avoid criticism of the temporary measures which England may adopt. On the other hand, he has been assured by Sir Henry Babington Smith, the acting High Commissioner for Great Britain to the United States, that every effort should be made by Great Britain to make all necessary adjustments as easy as is possible under the circumstances for the other friendly nations affected by these readjustments.

"Under the circumstances there is but one thing for the American exporter to do while he is excluded from England by these temporary import restrictions—he should not be idle."

Static, Dynamic and Notch Toughness*

Value of the Charpy Test in Determining Ability of Steel to Resist Rupture Under Notch Conditions—Its Use in Europe

BY DR. SAMUEL L. HOYT

THE property of steel that appears to have received the least consideration, at least in this country, is toughness, which is due, possibly, to our regarding toughness as a qualitative property or, at any rate, as one that parallels ductility. We have erroneously become accustomed to judging the toughness of a material from its behavior in the tensile or similar test.

The point of view presented in the present paper is that toughness, like hardness of tensile strength, should be regarded as an independent property and of sufficient importance to require, in so far as that may be possible, quantitative determinations. If such be true, it becomes at once necessary to devise experimental means for measuring or valuating toughness, and the notched-bar impact test (the Charpy test) is advanced as the most logical one that has so far been developed for this purpose. It is further advanced, with particular emphasis, that we have two kinds of toughness to deal with and, accordingly, they will be dealt with independently.

Materials Classified as to Toughness

Toughness has been defined somewhat as follows: Tough materials are those that offer considerable resistance to permanent deformation but which, once such resistance has been overcome, may be deformed plastically, but only by the expenditure of considerable energy. In other words, tough materials may be deformed plastically but they absorb a considerable amount of work in the process. This kind of toughness may be called static toughness when the rate of loading is reasonably slow or dynamic toughness when the rate of loading is comparatively rapid, as in impact testing, but in all cases the strain distribution is essentially uniform. However, static toughness does not imply resistance to shock, or dynamic toughness. In fact, dynamic toughness may be equal to, greater than, or less than the static toughness, thus dividing materials into three classes. This is well shown by numerous cases on record.

Notch Toughness

It is well known that a stress applied to a bar that has a sudden change in cross-section along its length produces a decidedly non-uniform strain distribution at the change in cross-section. If the change in cross-section is in the form of a nick or a groove, the strains at the base of the nick multiply and are much greater than the average strain over the cross-section. Such a nick, or sudden change in cross-section, is here referred to as a notch, and the non-uniform strain distribution, as the notch effect. The ability of a material to withstand stresses when in the notched condition is referred to as its notch toughness.

The notch effect is well illustrated every time a blacksmith nicks a bar to break it off at any particular point. Even a blow by the hand produces strains at the base of the notch well in excess of the resistance of the material and hence produces the fracture. A similar blow on an unnotched bar would merely bend the bar over. Thus it is that a bar, even though made of normally tough material, if notched, may behave as if brittle.

It is likewise known that the severity of the notch effect increases as the angle of the notch decreases. On this account the notch effect increases in most materials when fracture starts, because the angle of the fracture is generally less than the angle of the original notch. Certain pliable materials, or those that are self healing, of which lead is an example, behave in the opposite manner, since the notch becomes more rounded with distortion. In the same way a material of high notch toughness is much less dangerously affected by a notch than one with low notch toughness, a point that will receive consideration further on.

Notch Effect in Engineering Practice

The prevalence of the notch effect in engineering practice has been brought rather forcibly to the writer's attention by investigations of failed parts that have been carried on from time to time. It was noted that the notch effect may at times be intentionally introduced by the design of the part (sometimes faulty) and at other times may be unintentionally introduced by faulty or careless workmanship; of these, the latter is the more reprehensible and the more difficult to guard against. Another equally important point is the necessity of considering the microstructure and the desirability of heat treatment as a means of overcoming or counteracting the effect of the notch.

A certain railroad company was having trouble with splice bar failures, which from the records it was impossible to connect with roadbed conditions. Tests on parts of the failed bars showed that the material was well up to the quality required by the specifications, so that no basis for criticism could be made on that score. It contained 0.34 per cent carbon and 0.018 per cent phosphorus; it had an elongation of 35 per cent on 2 in. (50.8 mm.); a tensile strength of 65,200 lb. (29,574 kg.); and a yield point of 33 000 lb. (14,968 kg.). On making a microscopic examination, the steel showed considerable free ferrite, in characteristic Widmannstättian structure, as may be seen from Figs. 1 and 2. Furthermore, the pearlite was of the familiar lamellar type that is characteristic of slowly cooled steels. The idea developed from this examination was that the two rails and the splice bars form a notch and that the structure of the bar was such that it could not always adequately resist the notch effect produced every time a car passed over the rail joint (repeated stresses).

The solution of this problem obviously lay in correcting or improving the structure of the splice bar, to which end a series of heat-treatment tests was conducted. By subjecting the bar to a temperature of 900 deg. C. for ½ hr. and quenching in oil, a structure was secured that was principally sorbite with only a small amount of free ferrite. The tensile strength was increased to 92,000 lb. (41,730 kg.) and the yield point to 45,000 lb. per sq. in. (20,411 kg.), but the elongation was decreased 22.5 per cent. A characteristic structure is reproduced in Figs. 3 and 4, which represent a small piece of a failed splice bar heat-treated in the laboratory. The original coarse Widmannstättian structure is replaced by a network structure, the major part of which is sorbite, a constituent composed of the original pearlite and most of the original ferrite. Compared to the Widmannstättian structure, sorbite may be said to be highly resistant to the notch effect. By the adoption of heat-treated splice bars the difficulty was eliminated.

Some truck forgings, solid rear axles and steering arms, failed while in heavy service. These parts were made by a well-known automobile axle manufacturing company and suspicion rested at first upon the truck drivers, particularly as the material was known to pass all specifications. It contained 0.485 per cent carbon; had an elongation of 27.1 per cent in 3½ in., a reduction in area of 45.6 per cent, a tensile strength of

*From a paper presented at the February meeting of the American Institute of Mining Engineers, New York, Feb. 18, 1918. The author is associate professor of metallography, University of Minnesota, Minneapolis, Minn.

Figs. 1 and 2—Original Structure of the Splice Bar, 65 and 425 Diameters Respectively

77,500 lb. (35,153 kg.), and a yield point of 39,900 lb. (17,690 kg.). An examination of the axle (not heat-treated) showed that the taper had been cut by a roughing tool in such a way as to leave the notch indicated in Fig. 5. Knowing the danger of the presence of such a notch if the steel were in a poor physical condition, a microscopical examination was made; this showed the condition represented in Figs. 6 and 7. Here again the presence of a relatively large amount of excess ferrite will be noted. The result of a simple oil quench of a part of the failed axle is shown by Fig. 8. While the free ferrite has been largely eliminated and sorbite has been substituted for pearlite, an even better heat treatment would be to quench the axle in water, to entirely prevent the segregation of ferrite, and to reheat to produce sorbite and the requisite mechanical properties.

Tests for Toughness

It has been customary to test materials by various static and dynamic tests and to judge from the strength and ductility whether the quality of the material is sufficiently high to warrant its use regardless of the design of the part, its relationship to other parts, or possible defects due to faulty workmanship. One of the objects of the present paper is to show that, in case the material is to be used in the notched condition, the usual tests are unable to differentiate clearly between materials that will probably stand up and those that are likely to fail. This means that it is necessary to supplement the ordinary tests with a test on notched bars.

In order properly to define what is meant by toughness, it was necessary to distinguish between conditions of uniform and of non-uniform strain distribution. Likewise in testing the toughness of materials the same distinction must be made, a point that, due to its more or less general disregard, is somewhat strongly emphasized here. A qualitative test for toughness quite commonly used is the nick and fracture test for fiber. This test is useful to a certain extent, but it should have no more place in scientific testing of materials than an ordinary scratch test for hardness. The reduction of area in the tensile tests is very frequently looked at with an idea of sizing up the toughness of the material. It is more correctly a measure of ductility and becomes a measure of static toughness only in a limited sense, inasmuch as it is the ability to deform and not the resistance to such deformation that is determined. The area of the stress-strain diagram may be taken as a measure of the static toughness. Such measurements show, for example, that the toughness of annealed carbon steels increases with the carbon content up to about 0.30 per cent C. This figure, combined possibly with the resistance to impact, should be very useful in case the strain distribution of the finished part is essentially uniform.

The value obtained by dividing the tensile strength by the proportional limit and multiplying by the elongation (Martens) may be very useful in certain cases; for example, in bringing out the toughness of pure copper. The value of this determination is also limited, as it does not include the resistance with which a material opposes permanent deformation. All of these values are of undoubted importance when properly interpreted, but none would bring out the weakness of the materials in the foregoing examples. In fact, due to their apparent indication of strength and resistance, they would be directly misleading.

The recognition of the peculiar weakness of certain materials when in the notched condition has led to the development of the impact test on notched bars as a supplement to the customary static and dynamic tests and for the express purpose of testing materials for toughness. In its present form the test is the result of systematic experiments extending over two decades or more by Barba, Frémont, Charpy, Ast, and others, which culminated in the reports of Charpy to the International Association for Testing Materials in 1909 and 1912 and of Ehrensberger to the German Society for Testing Materials in 1909. The accumulation of evidence over this period made possible the establishment of a standard test so that now it can be safely stated that the notched-bar test, or in particular the Charpy test, is capable of supplying information relative to toughness that the tensile test gives in but an imperfect, and often in a directly misleading, manner. The test shows the great danger of angular notches or sudden changes in cross-section, particularly when material of low notch toughness is used.

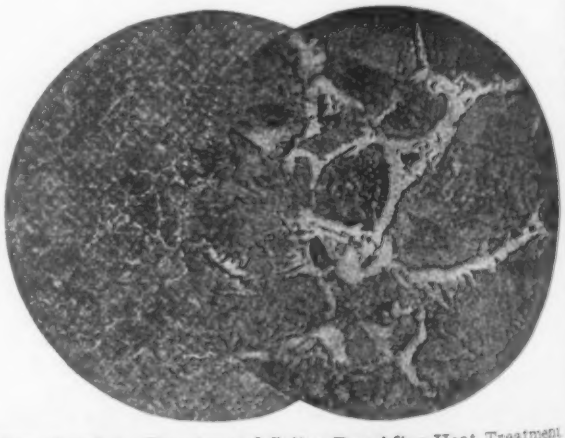
In the report of Ehrensberger, results of tests on three classes of materials were given: Forged carbon steels, forged special steels, and cast carbon steels. These three classes of materials can be compared by means of the figures shown in Table 1, which are taken from the report.

Table 1—Notch Toughness of Three Classes of Steel

Test No	Tensile Strength, Lb. per Sq. In.	Yield Point, Lb. per Sq. In.	Elongation,* Per Cent	Reduction in Area, Per Cent	Notched Toughness, Metric Tons per Sq. Cm.	Remarks
FORGED CARBON STEELS						
1	61,500	32,700	26.5	64	4.6	Forged too hot
2	64,100	36,100	26.0	70	20.4	Correctly forged
9	71,600	42,000	24.5	70	22.6	
10	71,800	40,000	26.4	60	4.7	Failed railway axle
25	142,200	93,000	12.1	36	8.5	High carbon.
FORGED NICKEL AND CHROME-NICKEL STEELS						
51	72,800	58,200	23.3	70	42.1	
69	130,000	108,600	15.1	62	22.1	
71	142,200	118,200	13.3	56	19.3	
75	270,200	232,500	6.5	31	8.3	
CAST STEEL						
161	68,000	37,700	22.9	51	3.7	

*The elongation is for a gage length equal to 10 times the diameter.

A few comparisons may serve to bring out the value of the Charpy test for toughness. Tests 1 and 2 show that the notched-bar test bring out the lack of toughness (or at least notch toughness) of test bar 1, which was forged too hot, although no evidence of this was given by the tensile test. Tests 1 and 25 show very plainly that the toughness cannot be entirely judged from the reduction of area or elongation; test bar 1 is



Figs. 3 and 4—Structure of Splice Bar After Heat Treatment, 65 and 565 Diameters Respectively

the more ductile of the two, but test bar 25 possesses the greater notch toughness. Test 10 shows how far the tensile properties can come from indicating lack of toughness as the probable cause of failure, although the true character of the material is brought out by the notched-bar test.

A comparison of the carbon steels with the special steels reveals a superiority for the latter that is not as clearly brought out by the tensile tests. The tensile tests indicate that the special steels have greater tensile strength for the same ductility but the superior toughness of the latter is better brought out by the notched-bar test. The tensile properties of the cast-steel specimens show that cast steel may have excellent elongation and reduction of area, and be thus apparently ductile, but be quite lacking in resistance when tested in the notched condition. Thus cast steel behaves the same as a piece of overheated steel.

In Charpy's report of 1909, an interesting case was cited to show that the notched-bar test can give information regarding steel that is in no wise suggested by the tensile tests, either static or dynamic. The results obtained with two steels A and B, really the same steel in two different conditions of heat treatment, are given in Table 2. Not even the resistance to fracture produced by a weight falling from a height of about 100 ft. (30 m.) as given in the next to the last column, indicates the excessive brittleness of steel B. The microstructure at once showed that B is in a much poorer condition than A. These figures could be multiplied almost indefinitely and have been well known for over a decade.

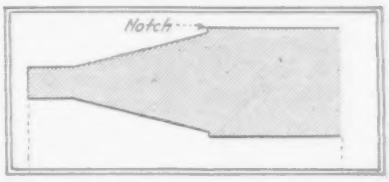


Fig. 5—Notch in a Steel Axle Made by a Roughing Tool

Table 2—Comparative Charpy Test on A Steel in Two Different Conditions

Steel	Elastic Limit, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation, Per Cent	Reduction of Area, Per Cent	Static Resistance, Kilograms	Tensile Impact Resistance, Kilograms	Charpy Test, Kilograms
A	42,800	59,900	32.0	67.2	179.5	205	44.0
B	42,700	62,700	32.0	65.6	185.0	195	2.7

There can now no longer be any doubt that there is some property, which is of great technical importance, that is not measured and in many cases not even indicated by the usual tensile test. In spite of this undoubted fact, the Charpy test, which is now extensively used in Europe, is given but little attention in this country. This would seem to be due to lack of familiarity on the part of users of steel with the facts that in a very large number of cases materials are used in a notched condition, whether intentionally or otherwise, and that when so used the tensile test offers no reliable index of their probable behavior. If these points were considered, the purchaser would certainly insist that his materials show a high degree of notch toughness in all cases where they are to be used in the notched condition.

Summary

Undoubtedly the occurrence of the notch effect in machines and engineering structures is much more common than is generally recognized. This is generally due to the design of the structure but may be caused by faulty workmanship. Even a hasty examination of such machines as locomotives, automobiles, stationary gas engines, steam engines, etc., reveals an amazingly large number of notches and in many such cases the material composing the parts should have a high degree of notch toughness to insure against failure.

The logical test for such materials and the only one capable of yielding reliable results is the notched-bar test. This test should supplement the usual tensile or hardness tests and its results used as an index of the resistance of the material to the notch effect.

Figs. 6, 7 and 8—The First Two Photomicrographs Represent the Original Structure of a Rear Steel Axle 65 and 565 Diameters Respectively. The last one represents the structure after oil quenching, the magnification being 130 diameters

A factor of safety is generally used in the design of parts of machines requiring the material to have a certain strength combined with a certain amount of ductility. These properties are written into the specifications and the material is inspected on such a basis. Neither the factor of safety nor the usual properties offer a guarantee against failure in cases similar to those discussed here. It is for this reason that the cause of many failures remains a mystery when test bars taken from the broken parts are found to pass all specifications. The Charpy test would undoubtedly show a low impact value, due either to faulty heat treatment, in case the parts were heat-treated, or to lack of proper heat treatment.

The utilization of the tar and gas in by-product coke oven operation has been shown in an interesting way by the Koppers Co., Pittsburgh. The company has prepared in chart form as a wall hanger, a reproduction in colors of an apple tree which has produced a large amount of fruit. Each of the apples is named for some product obtainable from coal, and the main branches and subdivisions are also named so that one may get at a glance the path in the by-products recovery through which the particular derivative is obtained. A copy of the chart can undoubtedly be had by applying to the Koppers Co.

The file manufacturers of France to the number of 42 have formed a society, according to *L'Usine*, Dec. 5, 1918, with an office at 60 rue de Miromesnil, Paris. Eugene Wolff is director, and the functions of the society are principally to see that the tool steels necessary in the production of files be apportioned justly and as liberally as supplies can be obtained.

SCREW THREAD COMMISSION

House of Representatives Passes Bill to Extend Its Life for One Year

WASHINGTON, Feb. 25.—The House of Representatives has passed a bill to extend the life of the National Screw Thread Commission for one year after its statutory expiration, March 21, 1919.

The action was taken on a favorable report by the Committee on Coinage, Weights and Measures, which found that the commission is seriously hampered by the fact that four months have been taken up in gathering data and that the big work of the commission is still ahead of it. So far no opposition to the bill has manifested itself in the Senate.

Dr. S. W. Stratton, Director of the Bureau of Standards, is chairman of the commission. He testified before the committee concerning the importance of the work which the commission is doing. It has held six meetings attended by 29 representatives of the Army and Navy and 108 manufacturers, as well as representatives of the British Ministry of Munitions and the French High Commission. Before making a final report, the commission believes that an international conference will be necessary to provide a basis for arbitrary recommendations. In the meantime, Director Stratton declared the commission is preparing tentative reports on standards for the following: terminology, shape of thread, system of coarse screws, system of fine screws, system of small screws, system of pipe thread, system of hose couplings, system of instrument screws, and system of measurement and test.

Director Stratton also declared that the commission has found:

"(1) That there is not a common terminology among the users and manufacturers of screws; (2) that there is considerable deviation in many respects from the recognized standard shape of thread on the screws manufactured in the United States; (3) that there is considerable deviation in many respects in the accepted standard of pitch for screws manufactured in this country; (4) that there is not a standard whereby the accuracy of workmanship may be judged; (5) that there is not a standard method of measuring and testing for accuracy; (6) that there are numerous special screws used which are only slightly different, but just sufficiently different to prevent interchangeability; (7) that there is a desire among manufacturers of the United States for an international standard; (8) that an international standard is an absolute necessity if the present shipping and foreign trade program is to be successful; (9) the above conditions have seriously interfered with the naval and military operations during the war, and for many years have constituted a serious hindrance to commerce."

"The importance of international standardization," declared Dr. Stratton, "is not recognized as it appears to us it should be. The ships we are now building, and which will enter foreign ports where the United States flag has never before been seen, will carry into our competitors' markets the produce of our factories, and it is therefore imperative that the screwed parts of our products interchange with the screwed parts furnished by our competitors."

To Export Through Local Foreign Agencies

Organization on comprehensive lines for efficient marketing of American machinery, hardware, engineering supplies and building material is purposed in the association along these lines of the Factory Products Corporation, 2 Rector Street, New York, exporters and importers, with the Engineers Corporation, subsidiary of the J. G. White Engineering Corporation, 43 Exchange Place, New York.

The Factory Products Corporation is a consolidation of the Factory Products Export Corporation, organized in 1914 to make shipments to the Allies, and of the Manufacturers' Agents Co., organized in 1916 to develop American trade in South America. The trade connections of this consolidated corporation extend to the Argentine, South and Central America, China, India and nearby countries. Bonbright & Co., Inc., the inter national bankers, are the financial agents of the cor poration.

Instead of establishing local agencies, the company obtains its representation through local firms of recog nized standing, which devote all their time and knowl edge of the foreign markets to the American house and receive executive supervision from the United States in many cases exercised directly by resident executives appointed from New York. The policy is to infiltrate existing markets thoroughly with American goods be fore expanding to new quarters of the world.

Walker W. Vick, former receiver general of Santo Dominican customs, is president of the Factory Prod ucts Corporation. Its directors are: Louis E. Stoddard of Bonbright & Co., Inc., and the Marlin-Rockwell Co. George H. Walbridge of Bonbright & Co., Inc.; Arthur H. Lockett of Bonbright & Co., Inc.; Walker W. Vick E. J. Kulas of the Cuyahoga Stamping & Machine Co. E. N. Chilson of the J. G. White Engineering Corpora tion, and D. M. Barclay. Other officers are: Frank Smith, vice-president; Earl Harding, vice-president, and D. M. Barclay, secretary and treasurer. The corpora tion occupies the ground and mezzanine floors of the United States Express Building, 2 Rector Street, New York.

Recovering Potash from Flue Dust

WASHINGTON, Feb. 25.—In dealing with what he terms "The Crisis in the American Potash Industry," H. S. Gale, of the United States Geological Survey pays particular attention to the possibilities of recover ing potash from cement kilns and blast furnace flue dust. Despite the fact that the foreign supply has been cut off and that a domestic production of about one fourth the former importation has been built up, "it is unexpectedly disclosed that there is little or no market for potash either at the high prices that have prevailed or even at a considerably lower price." He says there seems to be no satisfactory explanation for this situation.

"The potash recovered as a byproduct from the dusts of cement kilns and blast furnaces bears great promise for future production that may be maintained in the face of competition," says Mr. Gale.

"It appears that a quantity of potash equivalent to nearly one-third of our normal annual requirements is now going to waste in cement-furnace dusts. The quantity lost in blast furnaces seems even greater, but we are probably not yet in a position to say what part of this is practically recoverable."

Effect of Heat Treatment on Bronze

In an article on the subject of the "Effect of Heat Treatment on Bronze," in THE IRON AGE of Feb. 6, a number of corrections are to be noted. Figs. 11 and 12 should be Figs. 7 and 8; Figs. 7 and 8 should be Figs. 12 and 11, respectively. In the caption for Figs. 11 and 12, the temperature given as 800 deg. C. should be 300 deg. C. The positions occupied by the authors as stated in the article were reversed, O. A. Knight being instructor in metallurgy and metallography, Pennsylvania State College, and E. F. Hansen, general metallurgist of the Bethlehem Steel Co. THE IRON AGE regrets the errors exceedingly, and hopes readers may have been occasioned no serious inconvenience.

Auxiliary Hoist Attachment

An auxiliary hoist of 2 to 5 tons capacity, with a high speed lift for attachment to any standard single-hook crane trolley is being marketed by the Pittsburgh Crane & Equipment Co., Sharpsburg, Pa. By the use of this new device a crane in service with a heavy load hook of slow hoisting speed can be supplied with a light hook of fast hoisting speed. The equipment is recommended for 10, 15 or 20-ton cranes. The manufacturers point out that the attachment is less expensive than an extra trolley on the same bridge, and does not occupy any additional space or reduce the cross travel of the trolley.

Secretary Redfield Explains His Plan

Believes One Cut in Prices Should Be Made —Proposes Consultation with Leaders of Industry—Six Members of New Board

WASHINGTON, Feb. 25.—Secretary Redfield's plan for the "readjustment of prices" to stimulate consumption and keep labor employed has reached the stage where it has been given an official name. It is to be carried out by "The Industrial Board of the Department of Commerce."

The exact make-up of the board, however, is not to be made public until later in the week, as half of the members have not yet accepted their commissions. It is to be made up of six members. As already announced, George N. Peek, former vice-chairman of the War Industries Board, is to be chairman of the new commission. The two "Government" members are to be Hugh Frayne, who represented the labor interests on the old War Industries Board, and Thomas C. Powell, Director of Capital Expenditures of the Railroad Administration. The addition of Mr. Powell to the commission foreshadows the likelihood that the commission will attempt to bring the railroads into the steel market. If it can succeed in doing this it will have accomplished a most important task. Chairman Baruch of the War Industries Board tried to do this last fall, at the time of the signing of the armistice, when the steel industry pointed out the importance of an increased purchasing program by the railroads. Then, however, Director General McAdoo declined to urge the railroads to buy, suggesting the possibility of lower prices later. Whether the new commission can find a price basis that will stimulate this particular class of buying is of great interest to the whole industrial world.

Will Not Readjust Wages

So far, however, there is nothing in any of the various announcements concerning the activity of the new commission which indicates that it will attempt to readjust wage rates. As much of the purchasing of steel by the railroad companies, especially rails, depends upon the cost of laying the rails and the general wage cost of making extensions, the importance of this factor cannot be overestimated.

So far, no one in the Department of Commerce or in the new commission is willing to speculate on a probable program, beyond general announcements of plans to "confer" with the industries. It is still likely that the steel industry will be the first to be touched, but even that is not certain, nor will they say who will conduct the conferences or where they will be held. It is promised, however, that something more definite will be forthcoming before the end of the present week.

The use of the words "price stabilization" in the various announcements concerning the new commission is the result of the difficulties encountered over the first reports that the commission would be a "price-fixing" body. Secretary Redfield has stoutly insisted that the procedure is to have nothing about "price fixing" in it, and that the prices which may be agreed upon will bind nobody, except the Government, in any purchases it may make. The prices will merely be proclaimed as prices which the Government officials believe to be fair. The question of a possible conflict with the Clayton and Sherman anti-trust laws has not been further developed, although all steps so far have been taken with the knowledge and apparent consent of Attorney General Gregory.

Laying Foundation for Resumption

"Through proper investigation and stabilization," declared the initial announcement of the new commission, it is expected that the foundation can be laid for the resumption of American business and for the furnishing of employment to returning soldiers and sailors—this through Government purchases, the publication of fair price lists and co-operation of the producer.

"To obtain this co-operation of the producer it is planned that the board shall call the various leaders of industry into consultation. The first of these conferences will be with representatives of industries producing basic materials, such as iron, steel, lumber, textiles, cement, copper, brick and other construction materials.

"It will be the endeavor of the board to interchange views with these representatives of industry in the fullest and freest manner possible. If these conferences result in a general agreement among the important basic industries upon proper prices and bases for prices at which sales will be made and this agreement is approved by the board, it is believed that the announcement of this fact will induce the nation to feel justified in properly beginning a buying program."

Secretary Redfield's Analysis

At the same time, Secretary Redfield gave out the following statement of the "General Conditions" which he believed to underlie the work ahead of the new commission:

1. There exists at the present time an abnormal situation in the industrial world. It is a condition of stagnation of business and industrial activity. Mills and factories are idle or are producing but a small part of what they are capable of doing; building operations, now deferred for several years, are not beginning—and in fact, resumption is not contemplated until the confused condition of the transition period are clarified. Many enterprises, such as street railway companies in various municipalities, laboring under restrictions of charter contracts, are confronted with advanced wage scales and unprecedented prices of materials needed for repairs and necessary extensions. Unemployment exists and this unemployment is increasing at such a rate as to challenge the best thought that can be given to the situation.

2. One of the striking features of the present situation is the high prices demanded for practically all articles and commodities of trade and commerce. This high price condition is undoubtedly the cause of most of the business inactivity, and, therefore, also is the cause of the widespread unemployment of labor.

3. The living costs of the present are unusually high and will continue high until there are substantial reductions in the cost of the necessary staple food stuffs.

4. A large and, it is believed, satisfactory latent buying power exists in the country—an abundance of money—but it is not being used to employ labor and to purchase goods and materials.

5. The present conditions have come about by a series of unusual happenings due to the war. The industries and labor of the country were diverted into new and unnatural channels in order to mobilize all efforts possible in the winning of the war.

The capacities of many factories were expanded, new ones built, abandoned plants remodeled and put into production, and industry was managed and operated in accordance with war necessities. This control and direction of effort and change of policies resulted in the complete suspension of the ordinary operation of the law of supply and demand, the de-

mand for war commodities and the necessary agreements with industries as to prices and terms of conversion of industry to war work, etc., had the effect of inflating prices to an abnormal extent, so as to encourage maximum production, even by producers operating under the greatest handicaps and at the highest costs. Prices were advanced disproportionately, some articles showing increase in selling prices over pre-war prices of 250 per cent, while others showed but approximately 50 per cent. The law of supply and demand is really inoperative at the present time, for the reason that it is found difficult, if not impossible, for this law to resume normal functioning, on account of the fact that at the present time the price relations between the industries producing basic essentials are out of balance and not properly adjusted to efficiently meet peace time conditions.

6. It, therefore, is apparent that the trouble resulting in the present stagnant, unsatisfactory condition of industry is due to the continuance of the high, uneven, unstable prices of war times, which were, in many instances, agreed to by agencies of Government functioning for war purposes and not to any unhealthy general condition. These abnormal prices still remain because there has been provided, up to this time, no agency to bring about the necessary reductions.

Solution of the Problem

Secretary Redfield, in an official statement, also itemized "some suggestions" which he said ought to be observed in seeking a solution of this problem. This summary follows:

1. A wise solution is equally important to the Government, to industry, and to labor, for their true interests are so indissolubly connected and united that no detriment can be suffered by one without a harmful effect and reaction upon the others.

2. The vital need of the situation is resumption of industrial activity to the fullest extent possible, and it should be the aim to find the wisest and most effective way to accomplish this.

3. It is felt that the proper basis of selling prices for the present will be found to be upon a scale higher than those of the pre-war days. However, the level should be established on the lowest plane possible, having due regard for industry, labor and Government. The announcement of such a plane of prices will immediately create confidence in the buying public.

4. It is believed that the reductions from the high prices to the proper level, so that consumers may be justified in buying, should be made at once by one reduction.

The effort should be to wholly eliminate the abnormal, unbalanced stimulation that business has had and the inflated prices that have resulted, and to start anew upon a normal level, and thereafter, industry, having adopted that level, can safely rely upon the law of supply and demand to govern future values. Such a policy adopted and announced will, it it believed, when understood by the consumers, induce at once sufficient buying to start factories, fill empty yards and warerooms, and to inaugurate the interrupted building and other programs.

5. Industry and labor have a mutual interest in remedying present conditions, but industry should take the first step by the reduction of prices of commodities and should require of labor only reasonable aid.

Called a Simple Program

For these difficulties Secretary Redfield outlined the following procedure as a remedy:

1. It is believed that a remedy for these conditions can be had by a comparatively simple program. As the President has approved my appointing a board which will make a study of the subject and take action thereon and as it will be made plain that the Department of Commerce and its board has the support of the President, there can be no doubt that industry generally will be glad to co-operate with the board in an endeavor to arrive at a solution of the difficulties.

2. Therefore, one of the first steps which the board should take would be to call into consultation and conference the leaders of industry in such numbers and by such groups as it may be felt is wise. Probably the first of these conferences should be with representatives of industries producing basic materials, such as iron, steel, lumber, textiles, cement, copper, brick, and other construction materials, and from time to time thereafter such others as may be deemed proper. It is believed, however, that industries dealing in finished products will be able to largely (if not entirely) adjust their prices in line with the above policy, without material aid from the committee.

3. At such conferences, the general situation or conditions outlined above and as they may change up to the time of the conference, should be considered and carefully understood, and the above-mentioned principles which ought to apply and govern the solution of the problems should also be fully understood and appreciated. It is believed that these principles and views will be readily accepted by the great majority of those called into conference, and further that if any of those who come into conference question these principles and views a discussion thereof in the conference will, without any considerable delay, lead to a unanimous acceptance thereof.

4. In addition to giving assistance to industry in reaching satisfactory price bases, the board ought to be able to give valuable advice in regard to such questions as the disposal of surplus war materials, it being desirable to accomplish this in such a way as to have as little detrimental effect as possible upon private industrial activities.

It will be the endeavor of the board to act promptly by consulting and interchanging views with these representatives of industry in the fullest and freest manner possible, with a view to aiding and assisting industry in general to resume activities to the fullest practicable extent. The immediate object is to bring about such reduced prices as will bring the buying power of the Government itself, including the railroads, telephones and telegraphs, into action and make it possible for the Government to state that it is willing to be a buyer for its needs at the reduced prices. If these conferences result in such an understanding on the part of the Government with respect to the important basic industries concerning proper prices and bases for prices at which purchases may be made by it, and these are approved by the board, it is believed that upon announcement thereof to the country in general the public will feel justified in promptly beginning a program of extensive buying.

Such a procedure will in substance establish immediately a basis upon which to resume activities, and in this way the law of supply and demand will be enabled to come into play and from that time forward it will control the changes and readjustments in selling prices of materials and the trend of prices, it is believed, will be upward and not downward.

Ready to Disband

While this program of Government price adjusting is being worked out the old Price-Fixing Commmission of the War Industries Board is almost ready to disband. Its term of office will expire Friday. Practically its last official act has been to fix prices on contracts for certain steel and malleable castings—couplers, side frames, journal boxes and bolsters—made last summer by the Railroad Administration in connection with orders for steel freight cars. These castings were made under new standardized specifications, and the supplying companies agreed to accept a price to be fixed by the commission, based on cost sheets which were to be submitted after the contracts had been partially filled. The commission did not reach this task until late last week. The prices it fixed were based on last summer's steel prices, and therefore have no bearing on the present situation, although they are to apply for the life of the present contracts. About two-thirds of the castings have already been delivered. Chairman R. H. Brookings declined to make public the prices, insisting that they were the private concern of the corporations which made the contracts, and that they could have no bearing on public market prices. Only five foundries were concerned. He took the same position last fall, when the commmission fixed on certain contracts for overseas rail shipments.

O. F. S.

Inland Steel Co.'s Export Policy

CHICAGO, Feb. 25—(*By Wire*).—The Inland Steel Co., Indiana Harbor and Chicago, has decided to conduct its export business on an independent basis, either selling direct or through such channels as may commend themselves, including exporting companies, though it will give to none of these any exclusive representation. The company expects to do a considerable business through Gulf ports, the water rates to the South being an advantage in this direction. It also is depending on more regular steamship sailings to the Orient via the Panama Canal from New Orleans. In Cuba it has already established an agency.

The name of the Watts-Myers Tool Co., Los Angeles, Cal., has been changed to the Myers Lathe Tool Co.

Exports of Metal Working Machinery

WASHINGTON, Feb. 25.—England and France are the chief purchasers of metal working machinery from the United States, according to the statistics compiled by the Bureau of Foreign and Domestic Commerce. By countries, the outgo of such machinery in December, 1918, was as follows:

Countries	Lathes	Other Machine Tools	Sharpening and Grinding Machines	All Other Metal Working Machines
Belgium	.....	.....	$420	.....
Denmark	$836	$1,731	1,003	$1,115
France	153,418	58,756	116,929	406,655
Italy	7,658	49,481	17,240	89,487
Norway	5,139	.....	.....	51,103
Russia in Europe	.....	942	.....	.....
Spain	10,643	13,260	13,452	28,379
England	144,689	428,260	152,687	390,139
Scotland	.....	34,887	6,050	.....
Bermuda	.....	60	5	.....
British Honduras	.....	.....	4	.....
Canada	177,852	120,334	20,572	173,117
Guatemala	.....	.....	110	.....
Nicaragua	.....	120	.....	53
Panama	.....	782	175	1,320
Salvador	.....	30	.....	.....
Mexico	3,242	2,062	1,082	8,797
Newfoundland and Labrador	.....	52	.....	555
Barbados	.....	268	.....	.....
Jamaica	.....	.....	182	.....
Trinidad and Tobago	.....	217	.....	407
Cuba	5,980	11,640	735	7,272
French West Indies	79	661	28	.....
Haiti	.....	72	.....	.....
Dominican Republic	.....	319	.....	302
Argentina	2,045	911	427	3,626
Brazil	1,172	13,287	12	810
Chile	8,158	5,277	5,838	16,010
Colombia	.....	427	.....	366
Ecuador	.....	36	.....	.....
Peru	777	62	3,678	65
Venezuela	.....	62	16	.....
China	1,297	.....	1,198	343
Japanese China	2,799	.....	.....	.....
Chosen	.....	580	.....	.....
British India	27,917	3,645	4,038	144,701
Straits Settlements	.....	727	.....	540
Dutch East Indies	33,271	2,796	858	10,971
Hongkong	.....	255	151	10,580
Japan	87,347	25,438	15,305	128,282
Russia in Asia	1,406	.....	.....	7,019
Siam	.....	1,076	.....	.....
Australia	13,029	13,434	16,118	28,302
New Zealand	.....	1,362	1,112	.....
French Oceania	.....	.....	65	.....
Philippine Islands	690	1,073	.....	834
British West Africa	.....	.....	622	15,108
British South Africa	2,987	2,152	1,855	106
British East Africa	.....	.....	.....	41
Total	$692,431	$796,534	$381,967	$1,526,405

Pulverized Fuel Equipment Corporation

The business of the Locomotive Pulverized Fuel Co. has been taken over by the newly organized Pulverized Fuel Equipment Corporation, with offices at 30 Church Street, New York, and Transportation Building, Montreal, Can. The purpose of the change is to broaden the activities of the former to cover the central power station, metallurgical and industrial fields. The system deals with the burning of anthracite and bituminous coals, lignite and peat in pulverized form. Officers of the new corporation are: Chairman, J. S. Coffin; president, J. E. Muhlfeld; vice-president and executive, H. F. Ball; vice-president in charge of sales, H. D. Savage; vice-president in charge of engineering, V. Z. Caracristi; secretary-treasurer, Samuel G. Allen.

The Eastern Machinery & Equipment Co., Commercial Trust Building, Philadelphia, is putting on the market the Porpoise brand of cup leathers for hydraulic machinery packings. Its product is treated with porpoise oil, graphite, beeswax and paraffine, and it is claimed that experiments have proved that this treatment will prolong the life of the leather.

The Hydraulic Pressed Steel Co., Cleveland, manufactured 18,000,000 shell forgings during the war, according to an announcement made at the annual meeting last week. In making these shells, 175,000 tons of steel were used.

OPINIONS ON RECONSTRUCTION

Prof. Fisher of Yale Presents Paper Before American Economic Association

Interesting opinions pertaining to reconstruction problems appear in the paper entitled, "Economists in Public Service," by Prof. Irving Fisher of Yale University, president American Economic Association. In emphasizing the importance of providing immediate solutions to pressing problems he states: "The war has lifted us for a time out of the old ruts. Consequently, the world is far more open-minded, more expectant, and more desirous of getting at the real truth of things to-day than ever before. But as the years roll by ruts will be worn again and, once worn wrongly, may be harder than ever to efface or correct."

In speaking of the international situation he says: "If the Allies should repudiate their own ideas of international reciprocity in trade relations and of the open door, and each should merely seek to secure all it could of territory, colonies, trade concessions, special investment rights, exclusive ports, coaling stations, canals, railway routes, and discriminatory tariffs, the Peace table will turn into a gamblers' table, on which will be dealt out the cards for the next great game of war, and, as often happens after a war, the ideas and ideals of the conquered will have made conquest over those of the conquerors."

In discussing problems of the United States he says: "There can be little doubt that we are facing a great peril to-day, the peril of perverting democracy for which we have just been fighting with such devotion." Again, "There are, I believe, two master keys to the distribution of wealth: the inheritance system and the profit system." In regard to the former he says: "I believe that it is very bad public policy for the living to allow the dead so large and unregulated influence over us. Even in the eye of the law there is no natural right, as is ordinarily falsely assumed, to will property. The disposal of property by will is thus simply a custom handed down to us from ancient Rome."

In regard to the latter he says: "May we not find ways, by legislation and otherwise, of modifying more or less profoundly the present profit system? I have in mind not only profit-sharing plans, plans for co-operative producing, buying or distributing, and schemes for allotting common stock to employees; but also, and more particularly, possible participating by the public itself through the Government. The latter, representing the public, is, with all its faults, in a better position than the private capitalist to underwrite great industrial undertakings, both because its resources are greater and because the chances of gains and losses in many different directions would tend, more fully, to offset each other."

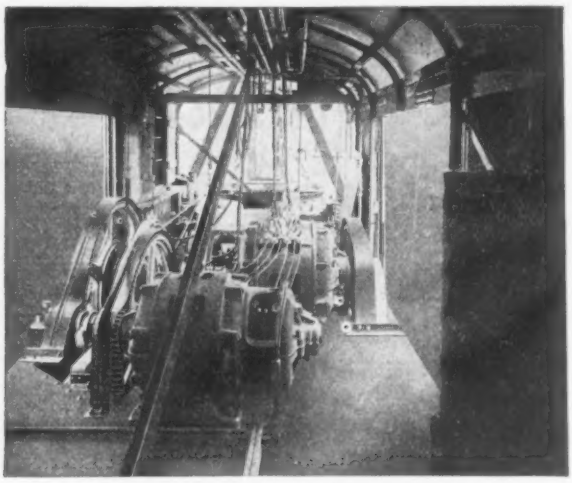
The economist expresses his belief in the education of the masses on basic economic principles. Referring to workmen, he states: "It is for lack of economic enlightenment that they approve of limitation of output, extravagant expenditure on public works, slackness and inefficiency of workmen, exclusion or destruction of labor-saving machinery, sabotage, limitation of apprentices, cessation of trade schools, etc."

In treating of industrial discontent he says: "The great reason why an industry fascinates the employer, but bores the employee is, in my opinion, that human psychologic laws are neglected." The author states that the workman must be made interested in the work in a manner outside of the mere money consideration. He mentions the soldier, who risks his life, not because of the money involved, but because of psychological reasons, because of pride in his work, so to speak.

The Standard Engineering Co., Ellwood City, Pa., recently made a shipment of 15 carloads of machinery to Japan, to be used in a plant there for making lapweld pipe. The shipment consisted of furnace charging machines, welding machines and other equipment. The company has made previous shipments to Japan of complete equipment for a seamless steel tube mill.

Motor-Driven Shovels and Draglines

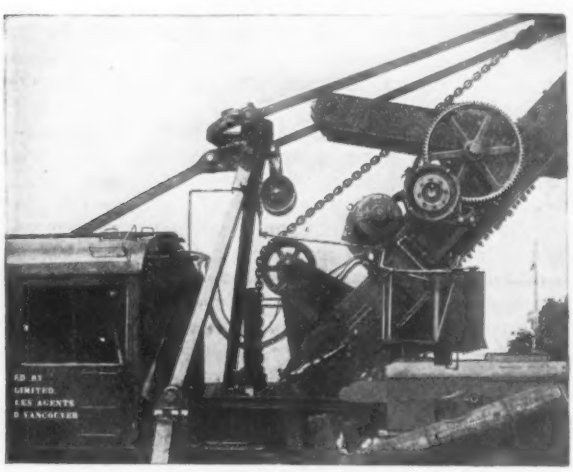
As a means of economy where electric power is available, in many cases electrically driven shovels or draglines are used for stripping overburden, mining coal, excavating, dredging, reloading coal and coke, making railroad cuts and similar work. The advantages claimed for the use of the electrically driven shovel and dragline are as follows: Lower operating cost when fuels are scarce, expensive or hard to transport; fewer operators required; fuel not an essential; no water to supply or freeze; no boiler troubles; no stand-by losses.



The Hoist and Swinging Boom Motors, Designed for Rapid Starts, Stops and Reversals

A line of shovel and dragline equipment which meets the especially severe service encountered in such work has been designed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Both alternating and direct current equipments can be furnished. In general, the location of the shovels makes alternating-current equipment preferable because alternating current can be transformed more economically, and by using the alternating current motors the necessity of converting alternating current to direct current is eliminated, resulting in simpler equipment.

The motors are of the wound-rotor type capable of exerting powerful effort at the instant needed in the cycle of operation. Each motor is mounted on a massive frame with a strong shaft and well supported bearings of the oil ring type. The rotating type is of smaller diameter and consequently has a low fly-wheel effect, which permits rapid starts, stops and reversals.



The Thrust Motor Must Be Capable of Exerting a Powerful Effort at the Instant Needed

The motors have few wearing parts and require little attention, except for an occasional oiling.

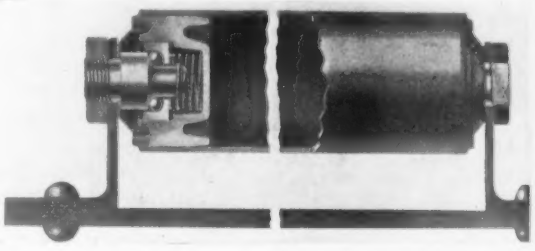
The controllers are compact, and are designed so that the operator, by manipulating his master switches, can cause the shovel to quickly respond. By means of the protective features of the controllers, the shovel or dragline can be operated at its maximum rate of operation without injury to attendants or equipment. It is claimed that with these shovels or dragline equipment not only more material can be handled, but more material at a lower cost per cubic yard.

Conveying Packages at Uniform Speed

A conveyor that has several new and interesting features has been placed on the market by the Buzz Engineering Co., Louisville, Ky. The bearings used are constructed on unusually rugged lines to withstand severe service. Ten ¼-in. balls are used as anti-friction members, and both cup and stud are case hardened and ground to size.

The retaining ring shown at the end of the stud serves to keep the component parts of the bearing assembled and has the additional advantage of permitting these parts to be replaced individually. The bearing is of the floating type, the ball cup being free to move laterally between the shoulder and the end of the roller. This feature provides for any possible variation in manufacture, such as inequality of roller length or difference in distance between the supporting rails. The cup glides back and forth according to whether the roller length is full or whether the spacing in the rails is scant and the coil spring in the rear of the cup exerts a slight pressure, thus keeping all bearing parts in proper relationship. This spring also automatically takes up the wear in the bearing and eliminates any adjustment.

The pressure of the spring upon the cup forces the balls up the curved shoulder of the stud, producing a retarding action in the roller when supporting no load.



The Spring and Cup Arrangement Automatically Adjusts the Rotation to the Load

When the load moves over the roller, these balls move down the incline, forcing the cup back against the action of the spring, thus releasing the wedging action and permitting the rollers to revolve freely. The advantages claimed for this feature are principally in preventing the roller from wearing itself out by useless rotations after the load has passed. The manufacturer also calls attention to the elimination of noise occasioned by 20 or 30 rollers revolving behind the load, and the automatic retarding of the roller, so that each package moves at a uniform rate. The speed for any inclination is controlled by increasing or decreasing the tension of the spring.

Elevating Truck with 6-In. Lift

A new type of industrial truck with a lift of 6 in. is announced by the Lewis-Shepard Co., Boston. This design is particularly adaptable in trucking loaded platforms over steep inclines, such as may be encountered in trucking out or into freight cars. It is made in 10 models, five of varying lengths having 8-in. wheels, and five with 10-in. wheels.

The truck is similar in appearance to the company's 3-in. lift type illustrated and described in THE IRON AGE, Oct. 18, 1917.

The official proceedings of the Fifth National Foreign Trade Convention, held at Cincinnati, April 18, 19 and 20, 1918, including all the addresses and the stenographic reports of the discussions and banquet speeches, has been published. It is a volume of 600 pages, and is sold at $2 by O. K. Davis, secretary National Foreign Trade Council, 1 Hanover Square, New York.

am-operated Flat Edge Trimming Press

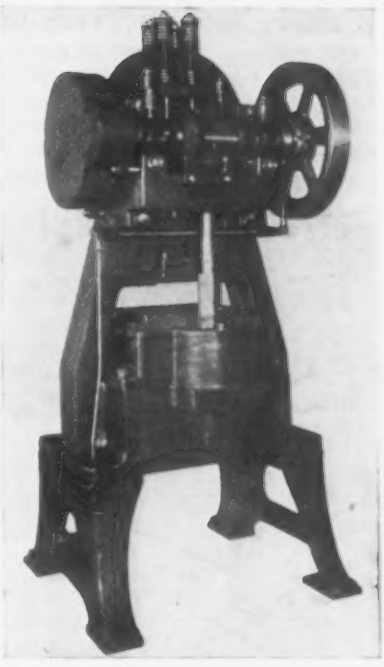
A flat edge trimming press, designed particularly r trimming the edges of stampings or sheets, so that ey may be united, for example, edge to edge for dering or welding without further treatment, has en brought out by the E. W. Bliss Co., Adams and rmouth streets, Brooklyn, N. Y. By securing a flat ge, further grinding or filing, usually resorted to, said to be eliminated. The machine is particularly plicable for trimming the flash or scrap from sheet-tal stampings where in one operation it accomplishes rk that according to present practice requires hand mming for smoothing and flattening the edges left the cutting tool.

To trim the stamping it is supported in a lower or lding die, which is provided with an opening shaped receive the stamping, so that the flash extends above e surface of the die. For best results a filler piece nforming to the interior shape of the stamping is d in place upon it. Its upper face is level with the per face of the holding die and serves to prevent the rk from tilting or becoming deformed during shear-g.

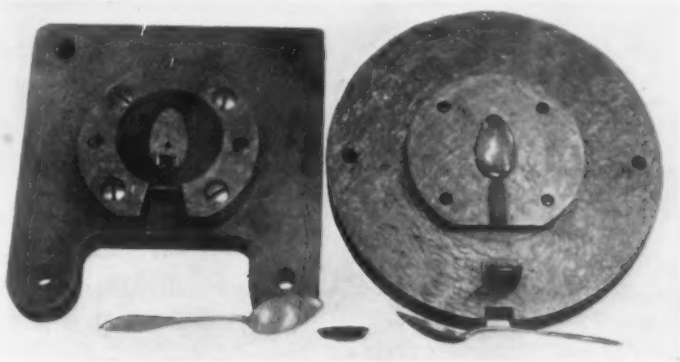
The upper or cutting die preferably has a contour mewhat irregularly conforming to the outline of the rface to be trimmed, but of slightly smaller size. hen in cutting position it is within the outline of this amping.

The shearing is accomplished by sliding the lower e sufficiently to cause the cutting die to pass over ery part of the surface to be trimmed in a direction om the inside of the amping outward. It s stated that move-ents, directed in our diverging direc-ions toward different arts of the surface f the stampings, will ffectively trim all arts of it, although a ubstantially rotary elative movement of hese cutting members s sometimes recom-ended. When the iller is attached to he cutting die it is ung by a pin in a ross-shaped slot to permit the cutting die to operate without moving it. Both dies are provided with extension surfaces carefully ground to the plane of the dies to insure a proper relation between them and to shroud the edges of the dies so that they are protected from injury incidental to improper adjustment. The stamping may be cut at any predetermined height by placing a supporting pad of the desired height in the holding die beneath the stamping.

The machine is essentially a cam-operated press, the upper frame having mounted upon it a ram which carries the cutting die. The holding die is reciprocated by a cam driven through gears from the main shaft carrying the flywheel. This cam reciprocates the holding die sidewise and backward and forward by means of two rollers, fixed springs holding the upper or cutting die against the other. The machine is started by means of a Stiles clutch and the shaft is allowed to rotate three revolutions to complete a cycle. The release is accomplished by means of a clutch operating on the main shaft.



The Shaft in the Foreground Drives at Its Lower End a Gear, Which Rotates an Externally Geared Cam That Imparts the Sidewise and Backward and Forward Motion to the Lower Die

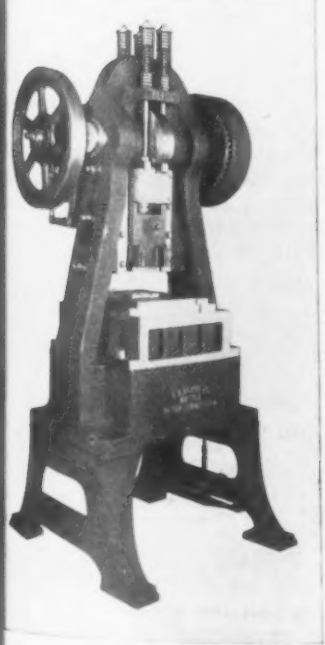


The Cutting Die (Left) Is of the Usual Hardness; but the Holding Die (Right) Is Preferably of Softer Metal, Acting to Prevent Damage to the Press Through Wrong Adjustment

The holding die is given four movements in two lines at right angles. These movements are produced through two slides, the upper one of which supports the holding die and has a slight longitudinal movement provided in the lower support of the slide. Gibs which overhang flanges on the top slide hold it in position. On the lower slide these gibs are held by threaded screws. The upper slide moves from front to rear of the machine and the lower from side to side. The respective movements of the slides are accomplished through a cam wheel externally geared and containing two cam grooves, where the upper cam groove actuates the die longitudinally by means of a lug and roller fixed on the under side of the slide. The sidewise movements of the lower slide are derived from the lower groove of the cam wheel which is journaled upon a tubular sleeve, which moves with it as the slide is moved. The cam wheel is capable of slight movement without hindrance from the pinion. Either the upper or lower slide may be made to move first by varying the starting position of the geared cam wheel. A rotary movement is imparted to the cam by the pinion carried at the lower end of the shaft which is driven from the main driving shaft by miter gears.

The entire slide mechanism and cam wheel are contained in an oil well filled through an opening in the frame and closed by a plug.

The necessity for using forming dies with sharp edges is said to be done away with, for the reason that the metal flows more readily into dies with good-sized fillets.



Flat Edge Trimming Press Which Operates by Dropping the Ram Holding the Cutting Die and Oscillating the Lower or Holding Die to Shear the Metal

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A branch of the Steel Treating Research Society is being organized at Hartford, Conn., and a preliminary meeting was held in the Chamber of Commerce there on Feb. 21, when about 50 metallurgists and managers of heat-treating departments signified their intention of joining.

British Foreign Trade in Steel in 1918

A complete statement of the iron and steel exports and imports of Great Britain for 1918 is now available, the war being ended. It was published in the London *Iron and Coal Trades Review*, Jan. 10, 1919. It is regarded as more complete than monthly data published during the war and compares with pre-war statistics.

Total iron and steel exports, excluding ore and including scrap, were 1,617,917 gross tons as compared with 2,344,801 tons in 1917. The corresponding total in 1913 was 5,049,090 tons.

Pig-iron exports for 1918 were 416,861 tons as compared with 638,281 tons in 1917. In 1913 they were 945,262 tons. Exports of spiegeleisen, ferrosilicon and ferromanganese, principally the latter, were 66,279 tons in 1918 as compared with 94,477 tons in 1917. In 1913 these were 178,919 tons.

Tin-plate exports last year were 223,500 tons, but they were only 177,383 tons in 1917. Both years show a decided shrinkage from 1913, when they were 494,497 tons. France and Australia took the larger portion of the 1918 outgo.

The exports of steel bars in 1918 were only 160,845 tons as compared with 428,452 tons in 1917. France took over 70 per cent in both cases, probably largely shell material. In 1913 these exports were 251,059 tons.

The galvanized sheet outgo dwindled to small proportions compared with pre-war trade. In 1918 the total was only 8835 tons as against 18,926 tons in 1917, but 762,075 tons in 1913.

Rail business has also fallen off, the exports having been only 26,335 tons in 1918 and 38,900 tons in 1917 as compared with 500,117 tons in 1913.

Exports of plates over ⅛ in. thick were 111,744 tons in 1918 and 102,288 tons in 1917; in 1913 they were 133,949 tons.

Steel blooms exported in 1918 totaled 70,380 tons against 163,221 tons in 1917. These contrast with only 4478 tons in 1913.

Machinery exports of all kinds in 1918 were 134,953 tons, valued at £11,455,047 as compared with 199,101 tons in 1917, valued at £11,421,653. In 1913 these were 537,636 tons, valued at £24,762,019.

Imports

Import statistics show that 6,442,254 tons of iron ore was imported in 1918, of which 4,327,114 tons came from Spain. In 1917 this total was 6,054,594 tons, Spain contributing 4,171,582 tons. In 1913 the iron ore imports were 7,442,249 tons. The data also now give the manganiferous iron ore imports. In 1918 these were 123,606 tons, 190,186 tons coming from Spain. The total in 1917 was 135,061 tons, 80 per cent from Spain.

Steel blooms, billets and slabs imported in 1918 amounted to 20,046 tons against 58,402 tons in 1917. Of these the United States furnished 12,393 tons and 49,177 tons in 1918 and 1917 respectively. In 1913 these imports were 513,988 tons, of which 312,223 tons came from the United States.

Pig-iron imports in 1918 were 104,362 tons and in 1917 they were 141,486 tons. In 1913 these were 216,708 tons. Ferroalloy imports, probably largely ferrosilicon, were 24,992 tons in 1918 as compared with 13,640 in 1917. They were not recorded separately in 1913.

Manganese ore imports last year were 365,606 tons as compared with 331,264 tons in 1917.

Total iron and steel imports, excluding ore and including scrap, were 342,516 tons in 1918 and 519,439 tons in 1917. The total in 1913 was 2,343,173 tons.

At the annual meeting of the Ohio Seamless Tube Co., Shelby, Ohio, on Feb. 18, the following directors and officers were elected for the ensuing year: Directors, Judge Edwin Mansfield, chairman; A. C. Morse, R. C. Skiles, I. H. Denton, H. G. Hildebrant, H. E. Brubaker, E. W. Wiggins; officers, A. C. Morse, president and general manager; R. C. Skiles, vice-president and assistant general manager; G. L. Reichert, secretary and treasurer; R. R. Johnston, superintendent; F. L. Benham, purchasing agent and director of sales; S. D. Inscho, chief engineer of maintenance.

Gear Standardization Progress

In the movement looking to the standardization of gear making, one of the most important programs that automotive industries have outlined for the reconstruction period, President F. W. Sinram of the American Gear Manufacturers' Association is urging to action the association's standardization committee. There was a well attended meeting of this committee at the Hotel Statler, Buffalo, Feb. 10 and 11. Apparently every gear concern had representatives in attendance and a well defined program was laid out for future activities. According to action taken at previous sessions the committee was urged to seek the co-operation of other organizations interested in the standardization of gears. It is probable that quite an advance toward the standardization of gears will be made before the annual meeting, to be held in April. The representatives at the meeting were as follows: Robert J. Coulter, Philadelphia Gear Works, Philadelphia; Lars G. Nilson, Nilson-Miller Co., Hoboken, N. J.; A. A. Ross, General Electric Co., Schenectady, N. Y.; B. F. Waterman, Brown & Sharpe Mfg. Co., Providence; Chester B. Hamilton, Jr., Hamilton Gear & Machine Co., Toronto, Can.; S. A. Smith, Meisel Press Mfg. Co., Boston; John Christensen, Cincinnati Gear Co., Cincinnati; F. C. J. Awig, Van Dorn & Dutton Co., Cleveland; J. C. O'Brien, Pittsburgh Gear & Machine Co., Pittsburgh; F. W. Sinram, Van Dorn & Dutton Co., Cleveland; Henry J. Eberhardt and Frank E. Eberhardt, Newark Gear Cutting Machine Co., Newark; Wm. W. Taylor, Taylor Machine Co., Cleveland; George F. Stahl, Stahl Gear & Machine Co., Cleveland; W. H. Lyman, Warner Gear Co., Muncie, Ind.; C. E. Crofoot, Crofoot Gear Works, Boston; F. Schneider, Van Dorn & Dutton Co., Cleveland; W. H. Diefendorf, New Process Gear Corporation, Syracuse, N. Y.; Frank Horsburgh, Horsburgh & Scott Co., Cleveland; A. C. Gleason, Gleason Works, Rochester, N. Y.; C. H. Logue, Brown-Lipe-Chapin Co., Syracuse, N. Y.; R. L. Dodge, New Process Gear Corporation, Syracuse; F. Zollinger, Timken-Detroit Axle Co., Detroit; A. F. Cooke, Faucus Machine Co., Pittsburgh; and W. H. Phillips, R. D. Nuttall Co., Pittsburgh.

British Ferromanganese

The following statement regarding the British ferromanganese market appears in the London *Iron and Coal Trades Review*, Jan. 24:

The inquiries in the market for ferromanganese, particularly on Continental account, are becoming numerous, but the license difficulty is still operating against an active business being done. France and Belgian consumers would be eager buyers at the c.i.f. price of about £40, and there is also some call on Italian account. The home trade continues fairly heavy. Values remain nominally at £26 10s. delivered for the home trade, and about £58 to £60 for loose and packed respectively for other Continental directions. The price of manganese ore is about 3s. 6d. to 3s. 7d. per unit, c.i.f.

According to this, Continental buyers are offering about $200 per ton, while $290 to $300 is asked, with domestic consumers quoted at about $130 per ton.

The British manganese ore price is 84c. to 86c. per unit, as compared with an offered price here of about 80c. per unit.

The March meeting of the Engineers' Club of Philadelphia at Witherspoon Hall, March 18, 8.15 p. m., will be addressed by Dr. John A. Brashear, former president American Society of Mechanical Engineers, on "An Evening's Journey Among the Stars." At a special meeting April 23 Arthur J. Baldwin, vice-president McGraw-Hill Co., New York, publisher, will present an illustrated paper on "The Devastated Area and Its Reconstruction."

The United States Pressed Steel Co., Ypsilanti, Mich., manufacturer of steel whiffletrees, neck yokes and other steel products, has recently added new and enlarged stock rooms, laid tracks through various parts of the building for the conveying of stock and materials, and installed overhead conveyors to carry the products to various parts of the building and into the cars. Addition of more equipment is planned.

A Tool Demagnetizer

An electrical device called a demagnetizer has been placed on the market by the Electric Brazing & Welding Machine Co., 30 Church Street, New York. It is intended for demagnetizing cutters, flat tools, gages, rings, bearings, etc., that have become magnetized either being held on magnetic chucks, or from static discharges from belts. The instrument should be placed in a convenient location where magnetic chucks are being used, so that all tools and parts that have been held in this manner may be demagnetized by passing them between the pole pieces as shown in the illustration.

Tools such as cutters, drills, reamers, etc., that are

Cutting Tools Are Demagnetized by Passing Them Between the Poles' Pieces

magnetized will hold all small chips or other small steel or iron particles that they come in contact with, and will hold them usually on the cutting edge, which works to prevent the tool from cutting to its highest degree of efficiency, and has resulted in cases of cutter breakage, particularly when tools are run at high speed. By making the instrument a part of the tool crib shelf, all tools passing in and out of the tool room can be quickly demagnetized.

New Substitute for Tool Steel

One of the war-time developments in England due to the acute shortage of tungsten was the manufacture of an alloy steel containing no tungsten to take the place of tungsten high-speed tool steel. This steel, high in chrome and cobalt, and known as "cobalt crom" steel, is now being used by the Alloy Cast Tool Co., Cleveland, for the manufacture of dies and tools, being offered as a substitute both for carbon and tungsten high-speed tool steel. The steel is made by Darwin & Milner, Inc., Sheffield, Eng., and is received from this firm in pig form. The pig metal is melted at the Cleveland plant in a crucible and cast in molds in the form desired. The pattern makers make the same allowances for shrinkage as they do for soft steel. The cast tools are furnished in an annealed form to the customer, who machines them to accurate dimensions, and after hardening they are ready for use.

The alloy is being cast into blanking, drawing and forming dies, hot and cold trimmers for forge work, milling cutters, counter sinks, slotting saws and bending rolls. It is also stated that cast tools made from this alloy are being successfully used as cutting tools on lathes, planers and shapers when working on brass and bronze. The metal produces, it is claimed, a clean casting free from blow holes and other imperfections.

The Alloy Cast Tool Co. has established a plant at West Ninth and Front streets. The company was recently organized and has the following as its officers:

President, W. E. Byrnes, president Steel Improvement & Forge Co.; vice-president, S. H. Moore, general manager Chisholm-Moore Mfg. Co.; treasurer and manager, H. P. Yaeger, formerly connected with the Cleveland sales office of the Firth-Sterling Steel Co.; secretary and superintendent, R. J. Ewart.

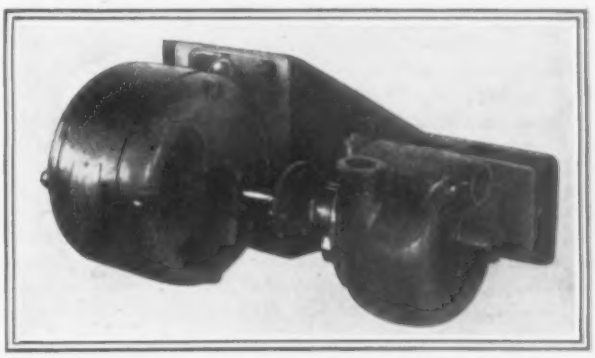
Pump for Oil and Compound

A line of direct connected motor driven pumps has been placed on the market by the Fulflo Pump Co., Blanchester, Ohio. These pumps are designed for use in connection with high-class motor driven machine tools, oil circulating baths and for supplying batteries of machines with cutting oils or compound.

They are all centrifugal in type, but retain their prime without the aid of valves or other mechanical means. The impellers are of the semi-enclosed type, and are supported by a bearing at either end of the impeller shaft. The thrust is on the suction side of the impeller and is taken care of by a hardened steel thrust collar on the impeller shaft which thrusts against the nose of the bronze bush supporting the impeller shaft on the suction side of the pump. The thrust at this point is slight, as most of it is taken up by the coupling between the pump shaft and the motor shaft. The main pump bearing also forms the pump gland and is of cast iron. The lubrication of this bearing is by a sight feed oiler which feeds into a pocket completely surrounding the bearing.

The shaft is of hardened and ground steel. The packing used is the flexible metallic type, and is guaranteed not to cut the shaft. The life of this pump is said to be exceptionally long, as the impeller, the only internal pumping part, does not depend on any contact fits for its pumping efficiency. Standard pumps have cast-iron bodies, covers and impellers, but may be furnished in brass or bronze when so desired.

The base is arranged for three-point mounting, which enables it to be leveled without the necessity of machining the surface to which it is to be attached. The pump is attached to the base by six screws, three of which extend through the motor and pump base and three of which extend through the motor base only, the pump base resting on their points. This makes it possible, by the adjusting of the screws, to bring the pump exactly in line with the motor, after which the screws



This Centrifugal Pump Is Driven by a ½ hp. Motor and Has a Capacity of 21 gal. per min. with 11 ft. Head. The pump is self-priming

are locked in place. The pumps can be furnished arranged for either wall or floor mounting.

The outfits are furnished in four sizes, as follows:

¾-in. pump with 1/6 hp. motor, maximum rating of five gal. per min., 18 in. suction without using valve and 15-ft. head lift.

¾-in. pump with 1/3 hp. motor, maximum rating of 18 gal. per min., 12 in. suction without valve and 20-ft. head lift.

1-in. pump with ¾ in. hp. motor, maximum rating of 27½ gal. per min., 18 in. suction without valve and 40-ft. head lift.

1¼-in. pump with 1 hp. motor, maximum rating of 40 gal. per min., 18 in. suction without valve and 40 ft. head lift.

The coupling used is the "Flexite" type manufactured by F. R. Blair & Co., and is fastened to both pump and motor shaft with Woodruff keys and set screws. Robbins & Myers motors are regular equipment.

PRESSED STEEL CAR CO. REPORT

Products Diversified So as Not to Be Dependent Upon Uncertain Railroad Conditions

The twentieth annual report of the Pressed Steel Car Co. shows gross earnings for 1918 of $4,818,893, the net earnings being $4,350,785, after deducting $460,107 for repairs and renewals. Ample reserves have been made for taxes, wheel replacements, etc. Considering the severe weather conditions in the winter and the epidemic of influenza, the officers are well satisfied with the record made.

The printed report states: "When the war began, the railroads were shackled by restrictions of Federal and State railroad commissions and persistent demands for increased wages. These conditions, together with reduced earnings, prevented the maintenance of roadbeds and equipment in the highest state of efficiency, and since the Railroad Administration took over the railroads little has been done in this regard, as every effort was being put forth to win the war. Less steel rails were purchased during the last five years than probably in any previous five years during the last 20 years, and there has also been less equipment built for domestic use, while on the other hand the gross tonnage handled by the railroads has greatly increased.

"Therefore it is believed that the time is near when larger expenditures must be made for the renewal and upbuilding of roadbeds and equipment since, when the railroads break down, serious results follow. The exhaustion of coal and ore, and the world shortage of pig iron, with increased freight rates and wages, will probably keep prices on a higher level than heretofore.

"Unfilled orders on hand Jan. 1, including the business of the Western Steel Car & Foundry Co., amounted to $73,000,000, of which 15 per cent was for the Ordnance Department and subject to termination, 25 per cent for military railways overseas, and about 35 per cent for the Railroad Administration for domestic use. As regards the cars for overseas, shortly after the armistice orders to 'suspend' were given, though the company as late as Oct. 15, 1918, was virtually commandeered to build this equipment and had received and contracted for large quantities of material. It is hoped that either the Government will soon be able to dispose of this equipment, thus using the material and furnishing employment, or secure legislation that permits fair settlement.

"The company has furnished expert engineers and draftsmen to collaborate with representatives of the railroads in the designing of several types of standard cars. Bids were asked for and the Pressed Steel Car Co. was awarded 14,000 cars. It was agreed that the company should begin work in 60 days, but, owing to the multitudinous questions arising through the attempt to arrive at standard designs and standard specialties that would be satisfactory to all the railroads, actual manufacture could not be commenced until about four months after the order was placed. This resulted in the loss of output at the McKees Rocks and Hegewisch Works.

"In June the company set aside over half the facilities of the Allegheny plant for the fabrication of ship material and was more than able to fulfill its obligations. Early in the year, the Government, desiring that the company should do more for it in special lines than the facilities at McKees Rocks and Hegewisch plants provided, requested that same be increased, the Government having the company at its cost provide the facilities with the understanding that the company would re-purchase certain buildings and machinery at their appraised valuation on completion of the contracts, but of course as these contracts have not been terminated, the exact position in this respect has yet to be determined.

"No prediction can be made for the future other than to say that wherever possible the effort has been to diversify the product of the company so as not to be wholly dependent upon the varied fortunes of the railroads, and yet be ready at all times to meet any reasonable demands. The company, together with its employees, subscribed to all the Liberty loans, Red Cross, Y. M. C. A., and other war relief funds. Subscriptions for the last loan amounted to $1,875,000.

"During the year there was spent in improvements and betterments the sum of $599,409, of which $370,5[illegible] was spent at the McKees Rocks Works, and the rest at the Allegheny Works. The powdered coal plant has been completely installed at the former plant and is the largest of its kind in the world, and has shown the savings estimated in its operation. At the Allegheny plant, the river frontage, built of wood piles 20 years ago, has become dangerous. So it was decided to build a concrete wall of new and approved design. This work was completed and the wall constructed with pockets in the rear which will be utilized for storage of coal, etc., and so defray a portion of the cost.

"The Orenstein-Arthur Koppel Co., the American branch of the Berlin house of Koppel, was taken over in June by Alien Property Custodian Palmer. It is located at Koppel, Pa., about 35 miles from Pittsburgh and manufactures a number of types of industrial cars, rails, and miscellaneous products, which are sold in every part of the world. On Sept. 12 the Pressed Steel Car Co. purchased the same as a going plant at a cost of $1,312,000, represented about one-half by the value of the plant, land, water, railroad and town site, and the other half by raw material, material in process and finished product. A new company has been incorporated with a capital stock of $1,600,000, of which $1,350,000 has been paid in cash. The plant will be operated entirely separate and apart from the Pressed Steel Car Co.

"The new steel casting foundry of the Western Steel Car & Foundry Co. will be ready for operation within the next 60 days, thus equipping this works for the manufacture of requirements of the trade in the western district. The plant is in good condition and efficiently organized to give production capacity of new and repaired freight cars, malleable, grey iron, and steel castings, forgings and car parts."

Preservation of Pipe by Deoxidization of Water

Uncoated black wrought iron and uncoated black steel pipe, tested as to the corrosive action of hot water, when equipped with and without deoxidizing apparatus, indicate according to data gathered by the Pittsburgh Testing Laboratory, Pittsburgh, that the use of the deoxidizer arrests almost entirely electrolytic or other corrosive action on the pipe. The results and data obtained were given in full at the January meeting of the American Society of Heating and Ventilating Engineers by F. N. Speller, metallurgical engineer National Tube Co.. The 2-in. lengths of both kinds of pipe installed Nov. 22, 1916, and examined Jan. 3, 1919, 2 years, 42 days after, carrying deactivated hot water, were found to be without any pitting, even where couples of brass and steel, and of copper and steel sheets had been placed to favor electrolytic action. A soft black coating was the only evidence of deterioration or chemical action present.

The specimens of zinc, brass, etc., already mentioned, were removed and sent to the laboratory in order to determine their losses in weight and general condition. The relative losses of weight were very striking. The zinc plate had lost in the deactivated water, in about 12 months, only 1 per cent as compared with 10 per cent in the untreated water in the same line; the brass plates 0.1 per cent in the deactivated water, more than 1 per cent in the untreated water; the steel in the riveted brass and steel couple lost about 16 per cent in the deactivated water, but was entirely corroded away in the untreated water; in the riveted steel and copper plates, the loss of weight of steel in the deactivated water was 20 per cent, while in the untreated water the steel was destroyed by corrosion before the end of the 12 months' period.

The free oxygen in this water was reduced on the average to about 7 per cent of the amount found in the raw water so that with a larger plant and more perfect deoxidation, still better results might be expected.

Predict Bright Future for Shipbuilding

New York Leaders in the Industry Express Confidence in Ability of America to Compete with Other Nations, but Protection Declared Necessary

OPTIMISM prevails among New York shipbuilders and shipping men as to America's future in the building, managing and sailing of ships. Exception is taken to statements attributed to Christopher Hannevig, owner of the Pusey & Jones Shipbuilding Co., that Americans are not a sea-faring race by instinct, that the United States shipbuilding program has been an "orgy of extravagance and miscalculation," that workmanship is inferior, that America cannot begin to compete with Great Britain.

"We cannot judge American shipbuilding by what they did in the war emergency where speed was the prime factor," declared H. K. Sutphen, vice-president of the Submarine Boat Corporation, Port Newark, N. J., to an IRON AGE representative. "Its ready adaptability to the war crisis makes it assured that the same ingenuity will be applied to peace conditions. When critics try to belittle us, we need only point to our war record. At the time of our entrance in the war, we had only 61 yards with 215 ways for constructing ships of over 3,000 tons; by Nov. 1, 1918, we had 198 yards and 1083 ways.

"In 1917 alone, the total loss of shipping tonnage through submarines was 6,600,000 tons. It was at this time that Balfour and the French representatives came to this country to see whether we were in earnest in our promises of help through our shipbuilding program. They found we were. At the time of the armistice, we were constructing at the rate of 4,800,000 tons a year. Our launching of 95 ships on July 4 was the final proof to the Kaiser that he could not win.

Helped in Allied Victory

"History will give immense importance to America's shipbuilding efforts as a cause for Allied victory. And if we have been resourceful in war, we will be resourceful in peace. It is true, our program has been expensive—everything was sacrificed to speed. But henceforth our labor costs will gradually decrease because the work is getting standardized, the workmen more efficient, waste motion is being eliminated, labor-saving machinery installed, the workmen are taking more pride in their output.

"Undoubtedly our shipbuilders are very highly paid; whether more highly paid than those of Great Britain, we do not know. If, because of the prevalent strikes in that country, they have to raise wages, the costs will be approximately the same in the two countries, perhaps. We want our workers to have higher standards of living than those of other countries. Our ships are better constructed than those of other countries with reference to the living conditions of the crews, as to sanitation and comfort. We want that to be so. Where other countries are *building* ships, we are *manufacturing* them by standard patterns. This will make the cost per ton grow lower."

Yankee Inventiveness

Another prominent shipper, when approached upon the subject of America's future, stated that matters would undoubtedly adjust themselves—because of Yankee inventiveness. "I expect some kind of specialization in American shipbuilding," he stated. "I don't think we will ever go in for tramp shipping. As an instance of specialization, look at the famous Yankee clippers, run by Yankee sailors, with a smaller and more efficient crew than employed by other nationalities. Of course, the Shipping Board is up in the air on the best method of adjustment to a peace-time basis, but rest assured, a good method will be arranged whereby our shipping can compete with that of the rest of the world.

"Of course, we have handicaps to overcome. We find ourselves with a large supply of wooden ships averaging 5500 tons, while Great Britain's ships average 9000. These small wooden vessels will not be adapted to post-war trade and will have to be disposed of by our Government, and plans must be made for the building of a larger type. But feel secure, America will soon find a way of competing with the rest of the shipping world."

When R. H. M. Robinson, president of Merchants Shipbuilding Corporation, was approached on the subject of America's future in shipbuilding and shipping, he stated that he was very optimistic.

"I am sure that the ships of our corporation are of a quality on a par with those of competing foreign nations," he stated. "They are rigidly inspected by experts and I believe that the same good quality applies to the products of the other shipyards.

Costs Will Decline

"Costs of operation are higher to-day for American ships than for those of Norwegian or British registry," he continued. "But our costs are bound to go down, and perhaps those of our competitors will come up and they will tend to meet. They will reach a static condition in not more than two years, probably at which time our rates will still probably be a little higher, but not seriously so. We are building ships more cheaply constantly as patterns become standardized, poor workmen become eliminated, and good workmen become better trained. Wages of crews will become lower as the war dangers of the deep are eliminated and the cost of living cheaper. These factors make smaller operating costs.

"During this period when costs are being gradually lowered, we must have some artificial remedy, such as subsidized merchant marine, Government-owned marine, or some form of shipping discrimination in favor of American bottoms. I am confident that the Shipping Board will evolve some sound scheme to take care of the future. I have attended conferences with big men of the shipping world and am optimistically impressed with the plans being formulated. The world needs all the ships that we are constructing and American ingenuity will find a way to compete."

Operating Costs

"Our costs of construction are less than $200 a ton and are growing less constantly," stated T. C. Desmond, president Newburgh Shipyards, Inc. "I believe that costs of building and operating are cheaper in some other countries, but I think they are going to increase when the workmen of these countries realize the better wages in the United States. No class of workmen knows better of foreign conditions than sailors and ship crews.

"Ours is a comparatively small shipyard," continued Mr. Desmond. "We are fortunate in having planned for the building exclusively of 9000-ton ships, which are large enough for after-war trade; also in being the first yard to have been 100 per cent completed. We have four ways and 33,000 workmen. In my addresses to them, I tell of the need of a greater quantity of production from each in order that we may compete with foreign ships. We are now getting the greater production, so that our cost per ton is decreasing in a straight, steep-slanting line.

"I have confidence in the intelligence of American workmen, and in the brains of our inventors of labor-saving devices. We will be able to compete in shipbuilding as we have in steel-making, which has flour-

ished in competition with foreign trade in spite of our high labor costs. New brains have been given to the shipbuilding industry in our country because of the boom, and because of these brains we will win.

"The public must support the Government for the present in protecting shipbuilding, a principle which is not new to us with our protective tariffs. The Government can guarantee to the best yards a certain amount of business for a certain period of years. That will allow each yard to develop efficiency methods and devices. Ultimately the privately owned yards can stand alone."

Engineers Meet at St. Paul

The annual meeting of the Minnesota Joint Engineering Board was held at St. Paul during the week of Feb. 12-15. This Board is formed from representatives of eight engineering societies of the state, the Northwest Association of members of the A. S. C. E., the Minnesota section of the A. I. E. E., the Minnesota section of the A. S. M. E., the Minnesota Engineers' and Surveyors' Society, the Engineers' Club of Northern Minnesota, the Engineers' Club of Minneapolis, the Engineers' Society of St. Paul, and the Duluth Engineers' Club, the last named a new organization which has just joined the Board. These societies represent a total membership of about 1000 technical engineers, and the joint board has been composed of one representative from each society. It was decided to recommend an increase in membership to three from each society, and to work steadily along the line of unity of action and efficient service.

At a banquet given at the close of the meetings the speakers were as follows: Edward A. Filene, of Boston; W. L. Darling, chief engineer emeritus of the Northern Pacific Railway; L. C. Fritch, vice president and chief engineer of the Chicago, Rock Island & Pacific R. R.; Oscar Hallam, Justice the Minnesota Supreme Court, and Dwight E. Woodbridge, of Duluth. W. H. Hoyt, of the D. & I. R. Railway is president of the Board.

Contractors Select Managers

At a meeting of the Executive committee of the Associated General Contractors of America, held in Washington recently, it was decided to engage G. W. Buchholz as acting secretary of the association with the duties of executive manager. Wm. A. Davis was also employed with the title of organization manager to assist the secretary.

Mr. Buchholz graduated from Columbia University, a civil engineer, in 1901. Since that time he has engaged in general contracting principally with the Snare & Triest Co., New York, and the North-Eastern Construction Co. of New York.

Mr. Davis was recently connected with the War Labor Board and has successfully organized a number of industrial associations, prominent among which is the National Association of Manufacturers.

The association has taken offices in the Conway Building, 111 West Washington Street, Chicago, which will be its headquarters with a branch office in New York, which will be at 225 Fifth Avenue, until May 1.

Chartering Ore Vessels

The Bureau of Foreign and Domestic Commerce has made public the following cablegram received from Consul General Skinner at London:

"Shipping controller given notice that official ore brokers will cease to charter tonnage for iron ore from March 1 as respects south Spanish or Mediterranean ports; from March 15 as respects ports north Spain and France. From these dates, trade must negotiate on open markets, but pending release of shipping any available British vessel under requisition will continue to be chartered to merchants by Ministry through brokers as respects approved cargoes."

COMPLAINTS FILED

American Sheet & Tin Plate Co. and Two Other Companies Called to Answer

WASHINGTON, Feb. 25.—"Trust busting" is on the Government's program again. The Federal Trade Commission has filed formal complaints in three cases that promise to be of considerable interest not only to the iron and steel industry but to the entire industrial world.

Two of them involve alleged violations of the Clayton anti-trust law. The third charges unfair competition in violation of the statute which created the Federal Trade Commission.

The cases under the Clayton law are the first of the kind which have been taken up by the commission in a long time. This evidence of "trust busting" activity at the present time is particularly interesting because of the repeated suggestion that the next congress would take up the question of amending the anti-trust statutes, in the light of the Government's war experiences.

The first of these complaints is against the American Sheet & Tin Plate Co. and charges price discrimination between customers. The other alleged violation of the Clayton law is charged against the Aluminum Co. of America and accuses it of acquiring a large part of the capital stock of the Aluminum Rolling Mill Co. and thus restraining competition between the two corporations. The third complaint is issued against the Corcoran Mfg. Co., Cincinnati, which it accuses of manufacturing an automobile radiator "almost identical" with the "button type" radiator manufactured by the Ideal Sheet Metal Works of Chicago.

The formal complaint against the American Sheet & Tin Plate Co. fixes a hearing at Washington for April 2. Its charges "on information and belief" follow:

That the respondent, American Sheet & Tin Plate Co. for several years last past, in the course of interstate commerce, has discriminated in price, and is now discriminating in price between different purchasers of the commodities manufactured, handled and sold by it, which commodities are sold for use, consumption or resale within the United States or the territories thereof, or the District of Columbia, and that the effect of such discrimination may be to substantially lessen competition or tend to create a monopoly.

The hearing in the case of the Aluminum Co. of America is fixed for March 29 at Washington and orders the company to show cause why it should not "divest itself of the stock unlawfully held in the aforesaid Aluminum Rolling Mill Co." The formal charges are as follows:

That the respondent, Aluminum Co. of America, a corporation engaged in commerce, did, during the year 1918, in violation of section 7 of the Clayton act, acquire a large part of the stock and share capital of the Aluminum Rolling Mill Co., a corporation also engaged in commerce, and that the said respondent, Aluminum Co. of America, ever since the time of said acquisition of said stock, has owned and still does own a large part of the stock and share capital of the said Aluminum Rolling Mill Co., and that the effect of the acquisition of said stock and share capital, and the use of the same either by voting or granting of proxies, or otherwise, may be, and is to substantially lessen competition between the respondent, Aluminum Co. of America, and the Aluminum Rolling Mill Co., or to restrain such commerce as aforesaid, in certain sections and communities, or tend to create a monopoly in such line of commerce.

In the case of the Corcoran Mfg. Co. the hearing is fixed for March 31 at Washington.

Freight Rates on Billets and Slabs

The present freight rates on billets and slabs, carloads, Pittsburgh, to the following cities are quoted herewith: Per gross ton, New York, $4.50; Philadelphia, $4; Boston, $4.90; Buffalo, $2.80; Cleveland, $2.30; Cincinnati, $3.60; Indianapolis, $4; Chicago, $4.40; St. Louis, $5.60; Kansas City, $8.70; St. Paul, $8; Omaha, $8.70; per cwt., New Orleans, 38.50c., and San Francisco, $1.25; Birmingham, $6.80 per gross ton on billets, and 57.50c. per cwt. on slabs.

National Board Rebukes Labor Leaders

Manufacturers at Canton, Ill., Praised for Their Fairness—Midvale Steel & Ordnance Co. Ordered to Institute Eight-Hour Day at Nicetown, Pa.

WASHINGTON, Feb. 25.—Almost the first rebuke that been administered to labor leaders by the National Labor Board is contained in the decision which it made in the strike of the employees of Parlin & dorff, manufacturers of agricultural implements at on, Ill. This company, employing 1100 men and en, has been conducting an open shop.

Not until lately have union activities in this com- ty been marked," says the statement of the War r Board. "Under the leadership of B. L. Cottrell, organizer from Peoria, Ill., this plant is reported ave been some 50 per cent organized within the few months.

In September, 1918, a petition signed by about thirds of the employees of the company was pre- ed, asking for (1) 9-hr. day at 10-hr. pay, (2) time one-half for overtime, (3) weekly pay day, (4) 10 ent increase in piece rates.

Upon receipt of this petition, the company re- ed the employees to select representative work- for a conference with the management of the com- on this petition.

This conference resulted in agreement on the part e company to arrive at a decision by Oct. 1, with understanding that should the decision be delayed, increases granted would be made effective begin- Oct. 1.

Prior, however, to Oct. 1, a committee of five em- ees, representing only a small group thereof, de- ed an immediate decision, and on Oct. 2, without er notice from the employees, some 75 per cent e men inaugurated a strike.

Thereupon, labor leaders from Peoria took charge e situation for the employees, urging the men to for greater increases and shorter hours than asked in their petition."

The first committee of the workers recommended a n to work and a submission to the War Labor d. The company declined to submit the case to board, but the men returned to work.

ate in October, the employees, represented by B. ottrell and J. D. Lonergan, "labor leaders from ia," presented a complaint to the War Labor Board. complaint was insufficient and a new one was pre- d Dec. 18, which materially modified the original. opy, says the statement of the War Labor Board, served on the defendants, either directly or indi- y, until the hearing held in Canton, Jan. 7.

A careful investigation of this entire situation," res the statement, "indicates that the employer has fairly with his employees, increasing wages from to time; that the original differences between the loyer and employees would have been amicably and factorily adjusted had it not been for the outside ences.

The company has operated an open shop and has discriminated against union labor, has indicated a ingness to bargain collectively with its own em- ees, as evidenced by the conferences held with com- ees on various occasions.

If there are any conditions as to safety and sani- n within the plant not conforming to the regula- and laws of the state, those are conditions to be ied through orders from the State Factory In- or rather than from this board.

Considering all the facts surrounding this case, complaint having been filed only a few days before signing of the armistice, and the corrected com- t having been filed more than a month thereafter, uld seem that there are no real grounds justifying n on the part of this board."

The board also refused to order the unionization of Galva, Ill., plant of the Hayes & Planter Co., employing 200 men. This corporation, it finds, conducted an open shop for many years and only in recent months have there been efforts by the union to organize the workmen. In August, Local Union No. 16231, A. F. of L., presented demands in the form of a union agreement to the company. These were ignored and Labor Department conciliators failed to settle the difficulties. The company declined to appear before War Labor Board examiners Nov. 26, stating that it should first have a fair opportunity to negotiate with its own employees.

"The evidence indicates, says the award, "that the company expressed a willingness to meet with a committee of its employees, representative of their respective departments, and agreed to such procedure, but the labor leaders insisted that the committee should consist of five, chosen as they saw fit. This position evidently deadlocked further negotiations."

Although insisting upon the right of employees to collective bargaining, the board warns that "the employees, in the exercising of their right to organize, should not use coercive measures of any kind to compel persons to join their unions or to induce the employer to bargain or deal with their union."

In the complaint of the employees of the American Can Co., Maywood, Ill., involving 800 men and 1200 women, the board declared that it believes employees were discharged for activities in connection with the Sheet Metal Workers' Union and recommends their reinstatement. It also recommends the election of shop and department committees for the purpose of collective bargaining.

In an award against the Midvale Steel & Ordnance Co., the board ordered the institution of an 8-hr. day at the Nicetown, Pa., plant with minimum wages from 65 to 80c. per hr. It also ordered an examiner sent to this plant to determine whether the present system of collective bargaining is fair and, if necessary, to order a new election of committees. It further declared that it shall be optional with the workers whether or not they join the Midvale Benefit Association.

Because the American & British Mfg. Co. has put into effect the Bridgeport award at its Bridgeport, Conn., plant, the War Labor Board has ordered it to make the same schedule effective at the Providence, R. I., establishment retroactive to Oct 10, 1918. Although it has just been handed down, this decision provides that it shall remain in force "at least until Jan. 31, 1919, but the company has until March 10, 1919, to make the retroactive payments.

"With regard to three employees discharged because of their failure to work a full day on Saturday, in accordance with the arrangement with regard to hours which was arrived at at the hearing," concludes this award, "the board cannot urge upon the company the reinstatement of these men who disregarded the working hours established in the plant, and particularly as they did so after fair warning of the consequences."

Because the other steel plants in Reading, Pa., have established the basic 8-hr. day, the War Labor Board has ordered the Carpenter Steel Co. to establish it in its plant.

O. F. S.

The Bureau of Industrial Research, 465 West Twenty-third Street, New York, has issued a handbook of the organizations associated with the National Labor Administration during the war, with notes on their personnel, functions and policies. The pamphlet is not a history of how the Government handled its labor problems during the war, but it explains how the various bands originated and describes their methods of procedure.

Many Are Added to the Unemployed

Effort in Congress to Cut Off Appropriation for Employment Service Complicates Situation — Nearly All Large Cities Show Increase of Surplus Labor

WASHINGTON, Feb. 25.—Strikes, strike threats, lockouts, and general labor unrest have become so general throughout the country that the Department of Labor is making little effort longer to conceal its apprehension concerning the next few weeks. The officials are praying that the winter will not break out anew, in the hope that if we have an early spring a resumption of outdoor employment will take the edge off the present critical situation.

The strike situation has resulted in sending broadcast a lot of new conciliators by the department, although the thorough union labor composition of the department has not helped to allay difficulties.

The employment situation—rather the unemployment situation—continues to grow steadily worse. The figures for last week show a heavy increase over those of the preceding week, thus maintaining the record of unemployment that has been mounting steadily for three months. The figures of the United States Employment Service show a surplus of 358,097 workers in 73 of the 122 cities from which reports are at hand. This is an increase of 36,312 over the preceding week, when the figures were 321,285. But it must again be emphasized that these figures are only fragmentary, and represent the actual conditions only in industries employing about 4,000,000 men. They are of importance only in showing the continued increase in unemployment. The number of cities reporting surpluses of labor has now reached 60 per cent of the total number of cities. Only 11 per cent—14 cities—report shortages of labor, and their combined shortage is only 5,185. Twenty-nine per cent of the cities—thirty-six—report supply equal to the demand.

Hard to Get Jobs

The Employment Service has found it difficult to make much headway against this increase in workers looking for jobs. The fact that the army demobilization has now passed the 1,200,000 mark and is still rapidly rising does not make it any easier. To help complicate the situation, a fight has arisen in Congress to cut off the appropriation for the Employment Service on the plea that it was only a war-time institution. In this connection, charges have been made that the service has been responsible for alarming reports concerning labor conditions in the hope of impressing Congress with the need for its work. The service, however, has limped along considerably behind other reports of the real shortages, and its figures still are considerably below the actual seriousness of the situation.

Even now, the figures given out by the service, pessimistic as they are, do not reveal all of the truth of the conditions in centers like New York and Chicago. As to New York, they only report a surplus, with no effort to give figures. As a result, no figures for the workless thousands of that metropolis are listed in the statistics that are included in the 358,097. With reference to Chicago, the service reports that the demand for labor there is equal to the supply. This does not agree at all with the reports from other sources, which report that Chicago is host to thousands of unemployed for whom neither the Federal nor the State employment services are able to find work. Reports from St. Louis, Boston and Philadelphia are equally incomplete.

In all these centers, the situation is greatly complicated by the influx of demobilized soldiers and by the workers who come from nearby centers where the cancellation of war contracts left them without work.

The most serious situation, apparently, still centers in Ohio, where Cleveland, with a surplus of 75,000 workers, heads the list. In that city, 19 iron and steel industries have discharged 446 men during the week, but added 505 to other iron and steel payrolls. For the entire state, the service telegrams estimate the unemployed at 110,000—5,000 lake seamen, 30,000 building trades, 25,000 semi-skilled, 10,000 clerical and 40,000 common laborers. Akron reports 2500 more workers than jobs, Cincinnati a surplus of 2350, Columbus 3000, Dayton 11,000, Toledo 8000, and Youngstown 5500.

More Idle in Pennsylvania

Reflecting this same condition, the situation in Pennsylvania is also growing worse. Pittsburgh reports 17,300 more men than jobs. In the detailed reports from this center, eleven iron and steel plants have laid off 459 men during the week, while forty others have added 119 to their payrolls. Erie has a surplus of 43[illegible] workers, Scranton has a surplus which is not estimated, Philadelphia and South Bethlehem are listed as "supply and demand equal." In South Bethlehem, one steel plant has added 100 men and the other laid off 300.

Connecticut and Massachusetts bear the brunt of the difficulty in New England. Bridgeport, Conn., reports a surplus of 7500, Derby 1000, Hartford 3000, Middletown 400, Norwich 2000, New Haven 6500, New London 200, Putnam 150, Stamford 350, Meriden 1500, Stafford Springs 440. Four plants under the head of "iron and steel" in Hartford report laying off 300 men and three in New Haven laid off 750.

In Massachusetts, the Employment Service reports that it has 40,000 unplaceable applicants for positions including 5362 machinists. Among the surpluses, Boston reports 4410—which does not take into account the floating unemployment—Lynn 1200, Worcester 650, while no estimates are made of the surpluses in Fall River and Lawrence. Brockton and Springfield report demand equal to the supply. Portland, Me., reports a surplus of 1000.

Albany reports a surplus of 6000, Buffalo 20,000, Binghamton 800, Kingston 1000, Rochester 4500, Syracuse 5000, and Utica 2550. Six iron and steel industries in Rochester laid off 973 men. There are strike threats in Cohoes, Troy and Schoharie counties, and the building trades strike in New York alone affects 100,000 workers.

New Jersey continues to reflect the growing seriousness of the New York situation. Until within two weeks, this State reported labor shortages. Now these are gone and the congestion in the northeastern portions is critical. The Federal Service has 4000 unplaceable applicants. Jersey City has 5000 more workers than jobs, Trenton has 3000, Newark 600, Elizabeth and Passaic 700 each and the surplusage at Paterson is not estimated. Only New Brunswick reports demand equal to supply.

Wilmington, Del., has a surplus of 1000. Four iron and steel plants report the intention to discharge 15 men which are not to be replaced.

Effects of War Cancellations

Michigan still shows the effects of war cancellations, with 10,000 unplaceable applicants on the lists of the Employment Service. Detroit has a surplus of 25,000 workers, only a few of whom figure in the state's 10,000. One big automobile concern expects to drop 500 men March 15, but another expects to add that number about the same time. Grand Rapids has a surplus of 1500 and Port Huron 500, while Flint and Jackson are still able to absorb the labor available.

The Illinois reports are vague. The Employment Service lists 3000 more men as applicants than it can find work for, but Chicago is reported as having a demand for labor equal to the supply. Joliet reports a surplus of 625, East St. Louis has an unestimated surplus, Peoria, Rock Island and Springfield are "equal," and Rockford is short 672 workers.

Indiana reports a surplus of 6200 in Indianapolis, which eight iron and steel plants contributed a "lay-" of 114; South Bend's surplus is 400, Terre Haute 0, Fort Wayne 500, Gary 50, and Evansville an un-timated surplus. Hammond says its demand is equal the supply, because 11 iron and steel plants are add-g 1114 employes, while one is laying off 190.

Iowa has 6000 unplaceable applicants for work. ilwaukee, Wis., reports 13,000 more workers than bs, Racine 1500 and Superior 850. Minnesota has ,000 men for whom the Em-oyment Service has not been le to find work. Minneapolis credited with a surplus of 00 workers, while St. Paul and uluth report the demand equal the supply. Nebraska re-orts a surplus of 300 in Omaha, ith the remainder of the state le to absorb its own labor.

Missouri has 10,000 men who nnot find work, although the tailed reports, strangely ough, again report Kansas ity and St. Louis as "demand ual to supply." Kansas City, an., has a surplus of 2000 ainst 1000 a week ago.

Montana reports 16,000 men t of work, largely the result f the strike difficulty at Butte, hich, however, is reported to improving. Nevada has 3000 nplaceable miners. Idaho re-orts increasing unemployment, t no figures. Salt Lake City, tah, reports a surplus of 3000. rizona has 12,000 unemployed nd a serious strike situation.

Unfavorable Coast Conditions

Pacific coast conditions con-inue bad. San Francisco re-orts a surplus of 8200, Los An-eles 8500, and Oakland 10,000. trikes and threats of strikes, s well as lockouts, have com-licated matters in the whole istrict.

Seattle, Wash., reports 50,000 en out of work, of whom 12,000 re in addition to those involved the strike. As a result of this ifficulty there has been a big nflux of unemployed into Ore-on, which now has a surplus f 10,800 on the employment pplication list, although the surplus" account of Portland lone shows 11,000

The South alone continues o show real shortages of labor. Much of this, however, is of little avail in indi-ating good conditions. A considerable portion is nly the result of the refusal of colored workers to re-urn to the agricultural districts or to the lumber amps. There is little extra demand for white help, nd sporadically there are instances of need for skilled abor. Virginia, however, reports a surplus of 2500 orkers in Norfolk, 1000 in Richmond and an unnamed umber in Lynchburg. Mine shutdowns have caused rouble in West Virginia, although some of the mines re running from two to four hours a week to give a ittle employment. Wheeling has a surplus of 1000. entucky reports a surplus of skilled labor, but a hortage of 450 common laborers in Louisville. Mary-and has a surplus in the state, but a shortage of 500 n Baltimore.

In a special plea to congress for the continuation of the United States Employment Service, Secretary of Labor Wilson called attention to the work which is eing done for Federal Government, state and munici-al employment services. Concerning the details of this project, he wrote in a letter to Representative Keating:

"In submitting the estimate for the U. S. Employment Service and asking for the appropriation 'to enable the Secretary of Labor to continue to maintain a system of labor exchanges and to co-operate with states and municipalities in continuing to maintain systems of labor exchanges in order to advance opportunities for profitable employment of the wage earners of the United States, including discharged soldiers, sailors and marines. I felt that it was absolutely necessary in order to keep industrial unrest at a minimum throughout the whole country and to facilitate the processes of readjustment to continue the Employment Service as established and operated in this department in co-operation with the public employment services in such States as have established them. These state employment services, either through their statutory organization or through the various state councils of defense have contributed during the period of the war to the maintenance of a federated employment service, supervised uniformly with regard to standards and practices.

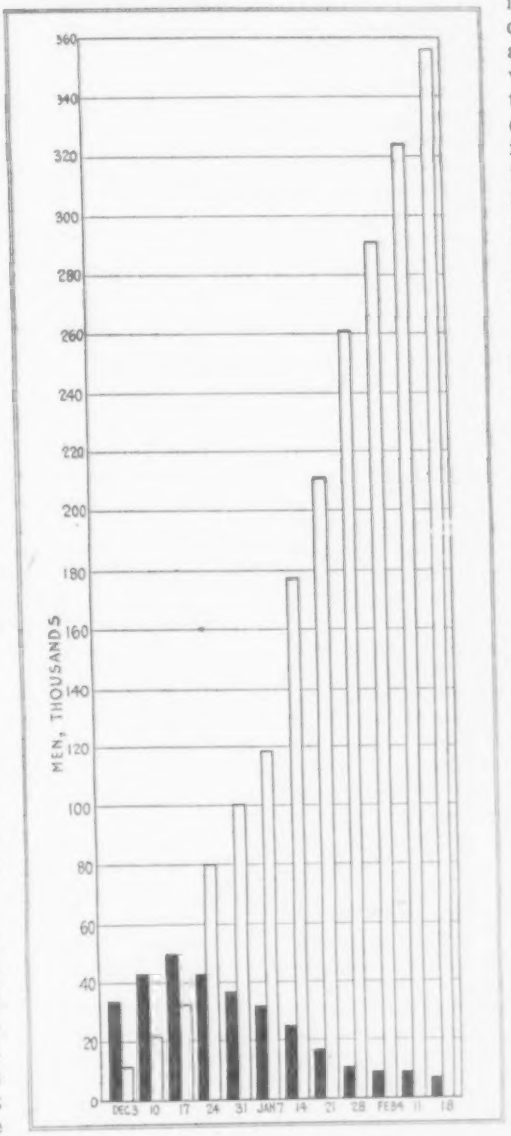


Chart Showing Steady Increase in Unemployment. Surplus of labor is indicated by unshaded columns and shortage by shaded columns

"It is the policy of this department to work toward a federated system of employment exchanges which shall be jointly financed by the Federal Government and the States (including municipalities and managed by the States under proper supervision from the Federal Government, so that every possible facility shall be given to wage earners out of employment in one locality or State to secure positions which are open in another.

"Agreements are already pending with certain States where the Legislatures have shown themselves inclined to grant an appropriation sufficient to maintain an adequate service under the proposed plan.

"Inasmuch as the maintenance throughout the country of an employment service at least adequate as that now in existence is required in order to avoid hardship and disorder during the period of military demobilization and industrial readjustment, it is necessary that the Federal Government should for the present be able to maintain its own system of offices in every State until the State is ready to meet its share of the burden and take over the management subject to federal supervision."

The seriousness of the labor unrest is emphasized by the following announcements given out by the Conciliation Service of the Department of Labor, the reference to the "labor rebellion" in Seattle is particularly striking:

"In an effort to prevent a repetition in Alameda County, Cal., of the recent labor rebellion in Seattle, the Department of Labor has assigned Commissioner of Conciliation Edward White to intervene in the controversy between shipyard owners and boilermakers in that district. Ten thousand men are out because of the refusal of the employers to meet the men's committee, according to a report to the department from the secretary of the machinists' union."

Commissioner James L. Hughes has been sent to Passaic, N. J., to take up an unusual situation in the

textile industry there. According to information reaching the department, the machinists have refused to submit their grievances to a committee appointed by the mayor of Passaic, on the ground that the members of the committee are unfriendly to labor. The situation is described as serious.

Commissioner A. L. Faulkner has been assigned to act as conciliator in strikes of employees of the Krein Chain Co., Wapakoneta, Ohio, and the Cleveland Chain Co., Cleveland. The Cleveland company, which is said to own both plants, is reported to have refused a demand for an 8-hr. day.

Commissioner H. J. Skeffington has been sent to Holyoke, Mass., to try to get the striking boilermakers of the Walsh Iron Works to return to work pending an investigation of their grievances by the Navy Department, which has contracts with the company.

Alleged discrimination against union men is the cause of a controversy in the Keystone Steel Co., Peoria, Ill. The members of the union have voted to strike unless the discharged men are reinstated. Commissioner David W. Benjamin is working on the case.

Settlement of a serious dispute at the International Shipbuilding Co.'s plant at Orange, Tex., has been effected by Commissioner Robert McWade. At his suggestion, officials and workmen will organize a federated alliance which will handle all controversies in future.

Governor Philipp's Survey

MILWAUKEE, WIS., Feb. 22.—Gov. E. L. Philipp of Wisconsin, in private life president Union Refrigerator Transit & Car Co., Milwaukee, in a publiic address at Janesville on Feb. 20 said the seriousness of the unemployment situation in Wisconsin has been overdrawn and is not nearly so bad as the public has been led to believe.

"I recently made a personal investigation in Milwaukee, the largest industrial center of the State," said Gov. Philipp, "and found that in 45 metal working concerns there were employed on Feb. 1 a total of 32,835 persons, compared with a total of 35,629 persons on Nov. 1, 1918. This shows a reduction of only 2794, and it is significant that more than 1000 of these were women. Some other important industries actually show an increase in number of employees on the same comparative basis. In general the reduction of forces so far is far less than we have been led to believe.

"Reconstruction, or what ought to be more properly referred to as readjustment of our economic situation, does not so far present any serious problems in the State of Wisconsin. Of course there must be some changes. So far as I know, industries are re-employing soldiers and in doing so men who held their places during the war must be shifted to other employments. The falling off, if there is any, is confined largely to the building trades, but this may be expected in this, the dull season of the year."

Union Is Suspended

SAN FRANCISCO, Feb. 21.—Regarding the labor situation it is now believed to have reached a crisis, which will be followed quickly by a general settlement or a general strike. The local iron trades council is standing by its agreement for a settlement made over two weeks ago and repudiated by some of its boilermakers. By this settlement the 48-hr. week was accepted. Boilermakers' Union No. 6 declines to be governed by this agreement and holds out for a half day on Saturdays, and the union has been suspended from the council. The latter has notified the Metal Trades Association that it is powerless to move further in the matter. The strike of the Boilermakers' Union of Oakland, which threatened to tie up all the shipyards, and did stop work at the Moore Shipyard, is apparently settled by the action of the international union, which has instructed the men to return. Some of the radicals have refused to obey the international and the secretary of the Oakland union, himself an extreme radical, has sent word to the international headquarters that revocation of the Oakland charter would be followed by the formation of a new union on the Pacific Coast of the radical elements. As not over 20 or 25 per cent of the men who struck are still out, it is believed that the strike is broken.

Cut in Wages Expected

It has developed that the wage advance given sheet mill workers at the last bi-monthly settlement, in January, of about 7 per cent, was due to a large order received by the DeForest Sheet & Tinplate Co., Niles, Ohio, from Japan, at war prices. At the time the advance, in the face of a falling market, was regarded as unusual. The Japan booking, however, made the average of prices higher than was shown by the examination two months before. The next settlement will take place March 10 and it is expected will produce a cut in wages for sheet mill operatives from 15 to 16 per cent.

Lukens Mill Workers Vote for Eight-Hour Day

Under the employee representation plan of the Lukens Steel Co., Coatesville, Pa., an election was held last week by the employees to determine whether an 8-hr, or a 12-hr. day would be established at the Lukens plant. The result was overwhelmingly in favor of the 8-hr. day. Employees of the Midvale Steel & Ordnance Co., Coatesville, will also vote soon on the same question.

Labor Notes

The Carpenter Steel Co., Reading, Pa., has just completed putting into effect rulings of the War Labor Board. The 8-hr. day, time and half-time for holidays and double time for Sundays have been instituted.

Several hundred men furloughed several weeks ago by reason of slack orders at the Steelton, Pa., plant of the Bethlehem Steel Company have been re-employed. Several departments that had been closed for repairs have resumed operations.

To counteract a rumor that they were not giving employment to returning soldiers who had been in their service, officials at the Bethlehem, Pa., plant of the Bethlehem Steel Co. have issued an announcement that in addition to providing places for all returning employees they have taken into their service 95 additional discharged men.

Effective Feb. 17, the Pennsylvania Railroad has reduced the working hours for all employees in its shops east of Pittsburgh, exclusive of those working in the engine houses, to 44 hours a week, or from about 6 to 5 8-hr. days, with proportionate reduction in wages. About 2000 men will be affected. The company has continued the reduction of its working force at the Hollidaysburg shops, with present total of about 110 men, as against 450 previously engaged at this location. The working force at the Harrisburg shops has also been reduced.

Spang & Co., Etna Street, Butler, Pa., manufacturers of oil well supplies, have reduced their working force of machinists. In order to allow for full employment of men heretofore engaged at the plant, the company, it is understood, has made an offer covering the return of a number of the men at a reduction of from 2 to 15 cents per hour in the existing scale.

Due to the necessity of curtailing production because of the lack of business, the Central Iron & Steel Co., Harrisburg, Pa., during the past week dismissed 300 employees.

It is stated that every man formerly employed in the plants of the Carnegie Steel Co. and other subsidiaries of the United States Steel Corporation in the New Castle and Sharon, Pa., districts who left to enter military or naval service is being taken back as fast as discharged from the service. It is said nearly 100 men formerly employed in New Castle, Pa., works have been given their former positions.

Employees of the Youngstown Sheet & Tube Co., Youngstown, Ohio, will shortly commence the publication of a monthly magazine. Its publication will be supervised by the committee chosen by the workers to act for them in the newly adopted representation plan. It will be under general direction of the safety department.

Mining and Metallurgical Engineers

Gun Steel, Manganese and Manganese Bronze Discussed at Annual February Meeting—New Name for the Institute

A VARIETY of subjects rather than emphasis on any one or two prominent topics was a distinguishing feature of the regular February meeting of the American Institute of Mining Engineers in New York last week, Feb. 17 to 20, the society's 119th convention. This was true of the various sessions of each division of the institute and proved eminently satisfactory to the large attendance, the largest registration in many years.

The name of the organization was changed at the regular business meeting on Tuesday to the American Institute of Mining and Metallurgical Engineers, this change having been under discussion for a year or two. Metallurgy, as applied to steel, has been a prominent phase in the institute's work and now that the Institute of Metals is a part of the larger organization, this phase is all the more emphasized.

Monday, Feb. 17, was devoted to the Institute of Metals and to simultaneous sessions morning and afternoon on industrial organization. On Tuesday, the sessions of the iron and steel section attracted many of the leading metallurgists of the country while on the same day a joint meeting was held with the Canadian Mining Institute. A luncheon was given to the directors and officers of the Canadian institute at the Engineers' Club by the American organization.

On Wednesday, the morning was devoted to papers on the work of the National Research Council and to a simultaneous session on mining, milling and geology. In the afternoon a large joint session with the American Institute of Electrical Engineers was held at which electric welding was the general topic.

A memorial service to Dr. Rossiter W. Raymond was held late Monday afternoon and one for the men of the organization who died in the service on Tuesday afternoon.

The usual social features were provided on each evening of the three-day session, the annual dinner and president's reception occurring Wednesday evening at the Biltmore. On Thursday, a large number of the members and guests went to the plant of the Federal Shipbuilding Co., Newark, N. J., where they witnessed the construction work on a steel ship by electric welding.

Iron and Steel Section Discusses Many Subjects

WITH Prof. Joseph W. Richards, Lehigh University, Bethlehem, Pa., in the chair, the first session of the iron and steel section was opened with a paper, "Does Forging Increase the Specific Density of Steel?" by H. E. Doerr, chief mechanical engineer, Scullin Steel Co., St. Louis, presented by title. This was abstracted in THE IRON AGE, Jan. 16. While forging greatly compresses or consolidates steel when it is in the spongy or porous condition, Mr. Doerr's experiments indicate that there can be but little or no change with steel initially free from cavities.

Forging and the Specific Density

Dr. J. S. Unger, manager, central research bureau, Carnegie Steel Co., Pittsburgh, in discussing this paper, said he believed it was the author's aim to show that cast steel is almost as dense as forged steel. The average results obtained by the author, he said, show very little difference in density—but 0.64 per cent between the unforged and forged specimens. Dr. Unger pointed out that since the author had heated the ingots to a temperature of 1235 deg. C. for forging, and after cooling had cut specimens from the forged and unforged portions, the results are really a comparison between steel annealed at 1235 deg. C. and steel forged from the same temperature, while the usual annealing temperatures for castings is about 850 deg. C., or about 385 deg. C. less than the temperature used in the experiment. Dr. Unger continued:

> To secure some information as to the density of steels as cast, annealed and as forged, and to show the effect of composition, the following experiment was made: A small ingot 3 in. in diameter by 10 in. long was cast in a dry sand mold from four different heats of steel. The ingots were allowed to go cold. A piece 3 in. long was cut from the bottom of ingot, and from the upper end of this piece duplicate specimens for density were cut out. The remainder of piece was annealed for two hours at the temperatures shown in the table, then allowed to cool slowly and duplicate specimens cut out. The upper portion of the ingot was heated to 1150 deg. C. and forged to ¾ in. diameter in 1½ min., then allowed to cool in the air, and duplicate specimens cut from the lower end, or what was originally adjacent to the first specimens. This furnished duplicate specimens as cast, as annealed and as forged. The results are shown in the table.

An inspection of this table across the page shows the first two steels to be the heaviest in the annealed state and lightest after forging. The last two heats are heaviest as cast and lightest as forged. By inspecting the columns vertically, the density increases as the carbon increases. This is not in accord with some other investigators, but may be accounted for in part by the high silicon in the last ingot of 0.55 per cent carbon.

Table of Specific Gravity Determinations on Four Steels

Compositions					Annealing Temperature, Deg. C.	Specific Gravity as Cast	Specific Gravity as Annealed	Specific Gravity as Forged
C.	Mn.	P.	S.	Si.				
0.11	0.53	0.012	0.041	0.026	900	7.817	7.832	7.809
0.35	0.53	0.014	0.044	0.047	850	7.827	7.828	7.824
0.49	0.52	0.016	0.050	0.033	850	7.833	7.832	7.828
0.55	0.41	0.015	0.046	0.250	850	7.862	7.859	7.850

There is very little percentage difference in any set of specimens from the same heat, but the point which stands out prominently is that the forged specimens are lighter, or have a lower specific gravity than either the cast or annealed specimens.

Dr. Henry M. Howe called attention to the existence of two factors in the consideration of this subject which produce opposite results. In the higher carbon steels, cementite is lighter than iron, while low carbon steels are more subject to gas cavities. The act of forging tends to close cavities. Many know, also, that it tends to cause cavities. This has been one of the great difficulties in forging—the formation of a central cavity. Therefore, one set of investigations may tend in one direction and one in another.

Notch Toughness and How to Test It

"Static, Dynamic and Notch Toughness," by Dr. Samuel Hoyt, associate professor of metallography, University of Minnesota, presented a new light on a phase of steel testing which has received but little consideration in this country. The paper is abstracted on other pages of this issue of THE IRON AGE. Because there are many cases where the use of steel involves the presence of an amazingly large number of notches the material composing the parts should have a high degree of notch toughness to insure against failure. Professor Hoyt shows means of making such tests and some re-

sults. The paper was presented in abstract by the author.

Dr. P. D. Merica, Bureau of Standards, Washington, in a written discussion stated that similar phenomena exists in non-ferrous metals. G. Charpy, inventor of the Charpy machine, testified in a written discussion to his agreement in general with the author's conclusions.

Dr. John A. Mathews, president Halcomb Steel Co., Syracuse, N. Y., said he felt that Professor Hoyt had not emphasized too much the notch bar test to which more attention had been given abroad than here. Shock and vibratory tests should not necessarily agree.

Most of the time of the morning session was taken up with the presentation and discussion of the problems of flakes in nickel steel for guns, but this was also brought up at the session devoted to the National Research Council on Wednesday, referred to later.

New Case-Hardening Process

The second session of the iron and steel section was presided over by J. E. Johnson, Jr., consulting engineer, New York. A new process for case-hardening was brought to the attention of the section by a paper by Prof. J. W. Richards, "The Shimer Case-Hardening Process." This was abstracted in THE IRON AGE, Feb. 20. The author, after presenting an abstract of his paper, exhibited a variety of samples of the results of the use of the process. He said that the case by this new method is deeper than when only cyanides are used, and showed photomicrographs to illustrate this. The inventor, it was announced, expects that the method will be made automatic.

Dr. Leonard Waldo, consulting engineer, New York, in opening the discussion, said that the significance and value of this new process were greater than appeared on the surface, while Mr. Johnson cited the fact that sodium cyanide is now being made from calcium cyanamide and sodium chloride. Professor Richards, however, said that there was no evidence thus far that any cyanide was formed in the use of this process, the actual reaction being still under investigation.

Steel Rails and Transverse Fissures

Transverse fissures in rails were brought before the meeting by a paper by G. F. Comstock, metallographist, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., entitled "A Metallographic Investigation of Transverse Fissure Rails with Special Reference to High Phosphorus Streaks." "The view that these fissures were due merely to fatigue under alternating stresses seemed most reasonable," said he, "until quite recently, because from work done in this laboratory as well as the work of other investigators of the problem no structural differences in the vast majority of cases were found between metal at the nuclei of transverse fissures and metal at similar positions in the same rails or in other rails that had not developed fissures. Within this last year or two, however, since the method of etching polished sections for the microscope with a cupric chloride solution has been tried systematically on lengthwise sections, passing through the nuclei of transverse fissures, evidence began to accumulate that there was a certain structural peculiarity of the metal associated with these fissures very often, showing its most distinct development at the nucleus rather than elsewhere in the section examined. So far as the writer is aware this particular method of examination has not been used by other workers." The author's paper presents his results, an abstract of which will be given in later issues of THE IRON AGE.

Dr. P. H. Dudley, of the New York Central Railroad, read a lengthy discussion in which he dwelt in part on the beneficial effect of reheating the blooms as a means of eliminating fissures.

In answer to a question by J. E. Johnson, Jr., as to why, if phosphorus streaks explain fissures, are there more phosphorus streaks in open-hearth than in Bessemer rails, Mr. Comstock said that in Bessemer steel the presence of a thick network of ferrite helped these rails to resist the development of fissures in spite of their high phosphorus streaks and that this may be the reason why Bessemer rails in general do not develop transverse fissures in spite of the streaks which would be expected from their higher phosphorus content.

After presenting an abstract in his paper, "Davidson Process of Casting Formed Tools," J. E. Johnson, Jr., exhibited a large number of tools made by the casting process. The paper was printed in part in THE IRON AGE, Feb. 20, 1919.

Water-Cooler Equipment for Furnaces

"Water-Cooler Equipment for Open-Hearth Furnaces" was presented in abstract by the author, W. C. Coffin, vice-president Blaw-Knox Co., Pittsburgh, Pa. In concluding his abstract the author summed up as follows:

As stated at the beginning of this paper, water-cooling devices for open-hearth steel furnaces should in general follow the lines used in iron blast furnaces. They should not, in a practical sense, be exposed on the inside of the furnace nor tend to slow up operations but should only absorb the heat that would otherwise be radiated in the air or be placed where they have a brick covering and keep it hard enough to hold and thus increase the life of the furnace and keep it true to its best lines. The writer has not had the time to incorporate in this paper the history of the development of these and other water-coooled devices; this will make an interesting subject for a paper in itself.

Many plant superintendents have devoted much thought to this subject and have developed equipment or contributed suggestions that have improved the devices herein illustrated and Mr. Knox can never speak highly enough of the help, co-operation, and encouragement that he has uniformly received from managers, superintendents, and engineers.

Dr. Unger said that he personally favored water-cooling, but to a limited extent, though at one time he advocated more universal cooling than is now usually practiced. He continued:

Water-cooling any furnace may be easily carried to the extreme. In an open-hearth furnace, excessive port or roof cooling, or cooling the working floors may preserve the lines of the furnace, lower the cost of refractories, add to the comfort of the workmen, and necessitate fewer shutdowns for repairs, but it may not be good economy on account of the high first cost, the cost of cooling water, maintenance of cooling appliances, and the immediate reflection in a higher fuel cost. The question becomes a financial one, and is answered by using water-cooling devices up to the point at which they cease to show true economies.

Open-hearth furnace bulkheads, roofs and ports fail rapidly in about the order named. If they could be made to last indefinitely by water-cooling, the furnace would still have to be shut down periodically for cleaning the slag pockets, regenerator chambers and flues.

Water-cooled doors, frames, valves and partially cooled ports are proper, and show economies, but it is doubtful if a completely cooled port as at present developed can be called a success. The difficulty of holding a refractory lining on the inner surface, the large volume of water required to cool the port, and the higher fuel consumption do not recommend it. An adequate supply of water free from scale forming salts is not always obtainable. When a heavy scale has formed, it may cause a portion of the port to burn out, necessitating a shut-down and expensive repairs.

Water-cooling should be used on an open-hearth furnace at such places where it can be protected by just enough thickness of brick to prevent high fuel consumption and where the cooling effect of the water is sufficient to prevent the brick from being rapidly destroyed.

Basic Refractories for the Open-Hearth

A paper by J. Spotts McDowell, research department, Harbison-Walker Refractories Co., and R. M. Howe, fellow, Mellon Institute, Pittsburgh, entitled "Basic Refractories for the Open-Hearth," was presented in abstract by Mr. McDowell. It discusses tests on various grades of dolomite and magnesite used during the war in this country. A summary of the authors' conclusions is as follows:

Comparison of Low-lime and High-lime Magnesite.—The magnesite that was the lower in lime showed less tendency to slake and higher refractoriness, as well as greater resistance to attack by firebrick and silica brick, and to the action of the corrosive mixture.

Comparison of Dolomitic Materials.—The materials highest in impurities and lowest in lime were most resistant to

king. With one specially prepared dolomite in which the nules had been coated with basic open-hearth slag, the erent tendency of dolomite to slake had been overcome a great extent. Another special preparation of similar racter showed practically the same degree of slaking as untreated dolomites. The specially treated dolomite stood the action of the corrosive mixture not quite as as an untreated dolomite high in impurities, and much er than the second special preparation. Except one ma- al, the purest dolomite showed the poorest resistance to rosion, although this may perhaps be explained by the high ition loss of the material as received and used.

Comparison of Magnesite and Dolomite.—The magnesites are more resistant than the dolomites or dolomitic preparations to slaking, also to the action of the corrosive mixture and that of fireclay and silica. One of the specially treated dolomites has a slaking tendency so low as to group it with the magnesites as far as this property is concerned. However, in resistance to corrosion it compares more closely with the untreated calcined dolomite high in impurities.

Considering these tests only, the value for refractory purposes of the materials studied may be placed in the following order: First, a magnesite low in lime; second, a magnesite high in lime; third, a treated dolomite; fourth, a calcined dolomite high in impurities; fifth, a treated dolomite; sixth, a pure calcined dolomite low in impurities.

Some Work of the National Research Council

MANGANESE and some results of the investigation of the steel ingot committee of the National Research Council took up the time of the Wednesday morning meeting, devoted especially to the work of the council. Dr. H. M. Howe, of the council, presided.

"Production of Ferromanganese in the Blast Furnace" was presented in abstract by P. H. Royster, the author, assistant physicist, U. S. Bureau of Mines. It presents data collected from the operating experience of several American blast furnaces making this alloy and has had wide circulation by the publicity department of the Bureau of Mines. It is a pooling of information for the benefit of producers, but may now be regarded as ancient history, said the author, since so many companies are gradually being obliged to discontinue making this product. The subject merited broad discussion, but none was offered.

Manganese in the Open-Hearth

One of the most valuable papers on the manganese problem was presented in abstract by its author, Professor Hoyt, University of Minnesota. It was entitled "Use of Manganese Alloys in Open-Hearth Practice," and will be abstracted in a later issue of THE IRON AGE. It presents concisely the results of the efforts of the research committee to investigate and perhaps recommend means of modifying steel-making practice so as to use in some way more of the low manganese ores as alloys in open-hearth practice. The paper covers the information obtained on three principal points: The use of molten spiegel mixture, the acquisition of a high residual manganese in the bath before tapping and the use of manganese-silicon alloys.

A. A. Stevenson, vice-president Standard Steel Works Co., Philadelphia, opening a discussion on this important topic, drew attention to how strange a difference a few months can make, for not long ago there was a fear of an insufficient supply of 80 per cent alloy, then a change to 70 per cent alloy, but now makers would be glad to hear how to make use of more 80 per cent alloy.

The question of the merits of "ladle steel" versus steel made in the bath or "furnace steel" was discussed by Dr. Hoyt and Dr. Howe. The former argued in favor of making as much steel as possible in the furnace. Dr. Howe said we must admit at first sight that ladle additions mean less loss of manganese and this is perhaps feasible practice when making the common steels. If cheapness of operation is the consideration, add the alloy to the ladle, but if the best steels are involved all additions should be to the furnace. Steel in the ladle should be completely molten, but in the condition of an emulsion so as to form a slight scull in the bottom of the ladle. Often in throwing cold ferromanganese into such an emulsion the alloy solidifies about itself a large quantity of metal.

How to Make a Heat of Gun Steel

In presenting a report of the steel ingot committee of the National Research Council, the chairman of which was Col. W. P. Barba, Dr. Howe gave a very interesting and clear review of the conditions and laws governing the making of a heat of cannon or gun steel in an open-hearth furnace. The presentation was illustrated by a chart thrown on the screen which was formulated as representing the results of an extensive investigation on this problem. It had to do with steel of about 0.35 per cent carbon with or without nickel.

Dr. Howe emphasized the main point as being a refinement of the metal hot and the pouring of it cool or "refined hot and poured cold." Deoxidation should be accomplished as far as possible by carbon, the oxygen escaping thus as a gas, whereas when brought about by manganese or silicon, inclusions in the steel are likely to result. After this deoxidation ferrosilicon should be added and not ferromanganese, to halt the removal of the carbon. Later the manganese alloy is added, not for deoxidation purposes, but to add manganese to the steel. As little deoxidation by manganese as possible is necessary to make acceptable cannon steel. In such practice the manganese loss should not be more than 15 per cent for otherwise poor steel has been made. From the addition of the ferrosilicon, the temperature should drop, thus arresting the loss of carbon and lowering the temperature so as to pour the heat under the proper conditions.

The effect of the time consumed in pouring such a heat was illustrated by slides by Dr. Howe. A given amount when poured in one minute showed a thin wall on the inside of the ingot mold and a large pipe, whereas the same quantity poured in two hours showed a thick dense wall and a very shallow small pipe.

Snow Flakes in Gun Steel

Probably the most important, though theoretical topic, discussed by the metallurgists at the convention, was that of flakes in gun steel. A paper at the session of the iron and steel section, "Flaky and Woody Structures in Nickel Steel Gun Forgings," by C. Y. Clayton, F. B. Foley and F. B. Laney, on Tuesday morning, and one at the session of the research council on Wednesday morning, "Microstructural Features of Flaky Steel," by Henry S. Rawdon, brought this subject prominently to the front. The authors of both papers, Mr. Foley for the first paper, presented abstracts. The discussions in each case were broad but of a distinctly technical nature. Dr. Rawdon, in an introduction to his paper, said:

> One of the most vital problems in the manufacture of steel at present is the occurrence of the defects that have been popularly termed "snow flakes," "flakes" or "scabs." Particularly is this the problem of many manufacturers who during the past two years have undertaken large-scale production for the first time. A study of the microstructure of such defective material throws considerable light upon the nature of these defects and is essential before measures may be taken for the elimination of these. Flakes do not appear to be found in the plain carbon steels; they have been found, however, in abundance in some of the simple alloy steels that are being used in such vast quantities; that is, nickel steel of the approximate composition, 0.40 per cent carbon and 3.50 per cent nickel, and in the chrome-nickel type.

The paper summarizes the characteristic features of defective steel of the flaky type as they have been found by laboratory study of numerous specimens, and aims to show the conditions within the metal that are favorable to the occurrence of this type of defect without entering into the details of mill practice, all of

which conditions appear to play a rôle in the production of the defects.

The authors of the first paper, mentioned above, had this to say:

It is believed that the terms flake and snowflake were first used by ordnance inspectors to designate the peculiar bright crystalline to granular silvery spots found in the fractured ends of pulled test bars from cannon forgings containing the type of defect now under consideration. The term flake has been rather loosely used and has been applied to any bright spots or areas in the fracture of broken test pieces. While possibly not the most desirable name for the defect it is at least somewhat descriptive of the phenomenon, is widely used, and appears to have become a fixture in metallographic nomenclature.

To the unaided eye, a flaky fracture is any type of fracture in which occur bright silvery spots or areas. These spots vary usually from 1/16 to ½ in. (1.5 to 12.7 mm.) in longest diameter and are surrounded by the usual gray to smoke-colored metal, which may be woody, silky, or the usual granular, the silvery spots being the flakes or snowflakes. A closer examination with a hand lens, or better with a binocular microscope, shows that the flake appears to be made up of more coarsely granular material than the surrounding metal and in many instances what appear to be the boundaries of polyhedral grains are distinctly visible. These are in the midst of metal of similar color or sheen but without definite crystalline structure. Much of nearly every flake examined in detail was made up of this apparently non-crystalline, or massive, metal in which the fracture presented an irregular nondescript surface. In the definitely crystalline parts of flakes, it was clear that the fracture had occurred in two ways, intercrystalline and transcrystalline. That is, the part of the rupture was partly in the ferrite between the grains or areas of sorbite and partly through them.

Effect of Flakes

The most characteristic effects of flakes, say the authors, are the loss of ductility and corresponding decrease in reduction of area; its tensile strength and elastic limit are reduced, but not so markedly as the other properties.

Mr. Foley stated on the floor that it was often necessary to make four forgings to get one good jacket and that records of 49 forgings show that four times as many were condemned for flakiness at the breech end as compared with the muzzle end. The breech end is made from the bottom end of the ingot. If these flakes could be attributed to overheating, the steel could be reclaimed, said Mr. Foley. His theory was, however, that heterogeneous austenite was an important factor. The type of steel represented by his investigation was electric steel, top cast in a 25-in. octagon iron ingot mold, stripped at 1200 deg. Fahr. or reheated at 1500 deg. Fahr.

Dr. Howe, in discussing Mr. Foley's paper, and later in his ingot report, said that Mr. Foley's theory as to austenite was ingenious and very important. Flakes are extremely puzzling. There are two radically different explanations. The common one is that a flake is a crack, a white one, formed at a stage anterior to the time it is visible. Subsequent heat treatment has no effect on it; it affects the inner structure but not the outer, even under mechanical treatment unless it is welded out. According to Mr. Foley's explanation, these flakes do not represent a crack; a flake represents a little particle in the center of a large grain or perhaps a concentration of carbon, phosphorus and sulphur in the center of certain grains.

Cooling in ashes lessens flakes decidedly, continued Dr. Howe. They occur in the same geometrical position in round as in square ingots. As to the difference in the breech and muzzle end of a gun, flakes are removed in machining the muzzle end.

F. N. Speller, metallurgical engineer, National Tube Co., Pittsburgh, called attention to the fact, as perhaps bearing on the problem, that nickel reduces the welding quality of steel, and Mr. Stevenson said that, in his experience in making such steels, the flakes were very noticeable in basic nickel steel and not in acid. For six to eight months they found no flakes in this steel. Later there was a radical change in the practice. When this steel was first made only low phosphorus scrap was used, but later nickel scrap and turnings were charged. This may have been a factor.

Dr. Howe, in his later discussion, when presenting the work of the ingot committee, stated that flakes are cavities or cracks formed at an early stage; they are light spots in a darker ground work. They are actually formed as cracks and lined with ferrite. They are usually found at one third the distance from the corner of the ingot toward the axis and are radial in direction. One never finds them in crucible steels, but only in tender steels such as nickel, chrome-nickel, etc. All these facts point to the ingot as the natural source of flakes.

Sessions of the Institute of Metals

W. M. Corse, president, Institute of Metals, presided at the first meeting of this organization on Monday morning, Feb. 17, its first gathering as an integral unit of the larger organization. The attendance was gratifying.

Most of the time of the first session was taken up by the presentation by Dr. Zay Jeffries, chief research department, Aluminum Castings Co., Cleveland, of his voluminous and valuable paper on "Effect of Temperature Deformation and Grain Size on the Mechanical Properties of Metals." It offers a more complete interpretation of the amorphous theory in metals than has heretofore been given, and it is believed, says the author, that Le Chatelier, Tammann and Heyn, at present the ablest opponents of the amorphous theory, will not be able longer to continue their beliefs that surface tension alone can account for all the observed variations in the properties of single constituent metals.

Automatic Copper Plating

A paper that brought out some discussion was presented in abstract by Professor Richards, "Automatic Copper Plating." In this new process the plating metal is applied to the sheet in the form of a liquid mixture by means of rolls, such as inking rolls. The sheet, after being coated with the mixture, is automatically carried forward and deposited on a link belt conveyor which carries it through a furnace maintained at a temperature well above that of molten copper. The basic principle involved lies in the application of the plating metal to the sheet while the sheet is cold and then melting the metal in place on the sheet under conditions which are favorable to the formation of the plating.

Professor Richards exhibited a sheet of copper plate made by this automatic copper plating process. While the plate, which was coated with copper on both sides, was of a burnished appearance, he stated that when it came from the machine it was dark in color, and had been given a light dip in sulphuric acid, and then automatically brushed to produce the luster. The object of the plating process, he said, was to provide a coating for iron which is cheaper than tin.

Other Copper Plating Processes

In discussing this paper, Alexander Silverman, head of the School of Chemistry, University of Pittsburgh, briefly mentioned similar plating processes, among them the copper coating of steel by hydraulic pressure, described by J. O. Handy, Pittsburgh Testing Laboratories, in an address before the American Chemical Society some years ago, and a recently devised method in accordance with which molten copper is poured around redhot steel forms, then hot rolled, cold rolled and cold drawn. This copper-coated steel was used by the United States Government for the noses of shells, and these were found to have twice the penetrating power of ordinary copper-nose shells. The proportion of copper and steel in these noses was 30 per cent of the former to 70 per cent of the latter, one-half of the copper coating being on the exterior and the other

half on the interior. Just before the armistice was signed the Government awarded a contract for shells of this type totalling $3,300,000, but this was later canceled. Unlike copper-nickel plated steel, copper plate coated by means of this process requires no annealing when it is worked up into a finished product. It has been also found that copper or brass-coated plate of this kind can be drawn to the very finest wire. For instance, wire five-thousandths of an inch in diameter has been drawn from an 8-in. billet. Copper-coated screen is also produced, as are plated steel springs. Springs with a 30 per cent copper coating can be tempered as readily as without coating. This plating process is used by the Copper Clad Steel Co., Rankin, Pa., said Mr. Silverman.

Manganese Bronze from Scrap

An interesting paper on "Manganese Bronze" was presented in abstract by the author, P. E. McKinney, chemist and metallurgist, Naval Gun Factory, U. S. Navy Yard, Washington. He described the production of a satisfactory bronze by the use largely of scrap metals. He stated that the results obtained after about three years of operation under the process have shown rather conclusively that the alloy, commonly known as manganese bronze, can be made without resorting to the use of high grade virgin materials, with the addition of what would ordinarily be termed detrimental impurities by the simple application of well-known laws of metallurgy.

Jesse L. Jones, Westinghouse Electric & Mfg. Co., Pittsburgh, said that the conversion of scrap into good manganese bronze was a noteworthy achievement but he would recommend such practice for a small foundry and for small castings only; he would hesitate to recommend this practice for large castings.

W. M. Corse, Ohio Brass Co., testified that this method was a practical one which has been checked by over two years of operation. The gun factory tests all heats, and they have been found constant.

G. H. Clamer, president Ajax Metal Co., Philadelphia, said he was much interested in the results and did not appreciate that Mr. McKinney used scrap so extensively. The original manganese bronze, known as Parsons, was made over 25 years ago and only the very best raw materials were used. This was at the plant of the Cramp Shipbuilding Co., Philadelphia. Later, as the result of competition, a cheaper alloy was made, using some scrap. In using zinc dross, only that from high grade spelter was employed.

The author stated that about 1,000,000 lb. had been made by this process in the last year, much of this in the shape of large castings. He exhibited tensile test bars of the castings.

Industrial Organization

How to reduce the labor turnover and minimize inefficiency through the more intelligent placing of employees, the extension of educational advantages among workmen, the improvement of living conditions and the thorough dissemination of American ideals, was discussed at length in papers and extemporaneous remarks in the session on industrial organization, Monday, Feb. 17.

The use of mental tests in industry for the purpose of reducing the misfits, and thereby the number of discontented and nomadic workers, was urged by Maj. Robert M. Yerkes, chief division of psychology, medical department of the Army. Major Yerkes, who supervised the application of mental examinations to approximately 1,700,000 army men, states that mental capacity in an individual remains relatively constant regardless of educational opportunities. It is a fact, he asserts, that high grade pupils in the schools can do twice the work of the children of low mental ability. Yet the more alert minds are not permitted to progress to the extent of their capabilities and the duller students are constantly behind in their work. As a result, many of both types become discouraged and lose interest in their studies. The present scheme of education, which assumes a uniform aptitude for learning, is wrong and calls for a remedy.

Major Yerkes urged a differentiation in the training of children from the first. He suggested that they be divided into three classes according to natural mental attainments, of which the group containing the brightest students would be groomed for professional vocations requiring initiative and imagination, the pupils of medium possibilities would be trained for industrial pursuits calling for skill, and the group representing the lowest intelligence would be utilized for manual labor. This plan, if adopted, would come much nearer to providing equality of opportunity than the present scheme of education, and would have the further advantage of placing people in occupations for which they are naturally suited.

While the use of mental tests as an adjunct to industry should start in the schools, there is no reason why a scheme for classifying employees according to intelligence cannot be adopted to advantage by American industries. Mistakes in the placement of men mean frequent changes in personnel and consequent inefficiency and discontent. If undertaken the problem should be attacked from the point of view of the individual rather than from that of the employer. If through a well-devised plan of classification, a man can be placed in a position to which he is suited and the duties of which he can perform well, the chances of his becoming dissatisfied and leaving for other work will be materially reduced. On the other hand, to the employer will accrue the benefits of a more permanent force and more efficient production.

HORACE V. WINCHELL
NEW PRESIDENT OF MINING ENGINEERS

Canadian Mining Day

A uniform mining law for the continent of North America was urged by American and Canadian engineers at sessions on Tuesday, Feb. 18, designated as Canadian Mining Institute Day. More than 100 members of the Canadian organization attended this conference. President R. W. Jennings of the American institute presided.

The speakers called attention to the fact that for a long time there has been much confusion in mining laws in Canada and the United States, and said they believed that these laws can be improved upon in such a way as to remove a barrier to international co-operation in mining.

The New President

Horace V. Winchell, the new president of the institute, was born in Michigan in 1865 and was graduated from the University of Michigan in 1889. He was assistant State geologist of Minnesota from 1889 to 1891, and then took charge of explorations for the Minnesota Iron Co in 1892-1893. He devoted 1893 to 1897 to general practice as an economist, geologist and mining engineer, and then became geologist for the Anaconda Copper Mining Co. and for other auxiliary corporations of the Amalgamated Copper Co., which positions he held until 1906. He was chief geologist of the Great Northern Railway, 1906-1908, and it is said it was his work which led to the discovery of the Mesaba iron ore range. In conjunction with Prof. N. H. Winchell, he was the author of "The Iron Ores of Minnesota," 1891, and also of many papers on the geology of ore deposits.

FIXES PRICE OF SCRAP

Minimum Named by Government, but Figure Is Not Made Public

WASHINGTON, Feb. 25.—Delay by Congress in fixing the size of our peace army is holding the disposition of surplus materials for the War Department. Until Congress has decided whether the army is to be composed of 500,000 or only 175,000, as has been proposed by the more pacific members, the various bureaus of the department find it difficult to determine just what reserves must be carried.

At the same time, the completion of inventories is proceeding slowly. Even in the question of machine tools, where the final inventories were promised almost a month ago, the schedules are still incomplete. Colonel A. La Mar, the head of the Machine Tool Section of the Division of Sales, is still in the West checking up on this situation.

The Director of Sales of the War Department, C. W. Hare, has fixed a minimum price on steel scrap. At his office, however, it was announced that this was a confidential figure given out only to the subordinate bureaus and offices of the War Department as a minimum price below which no negotiations for such scrap are to be undertaken. Details for publication were refused. Similar minimum prices for other items may be fixed later, but so far they have been limited to steel scrap.

War Contracts

The War Department is becoming apprehensive over the delay in Congressional action on the bill for the validation of war contracts. The conferees met last week in another effort to iron out the difficulties between the two houses of Congress, but failed to break the deadlock. This week they are being delayed by the fact that the Senate conferees are busy in the sessions of the Military Affairs Committee which is handling the new army appropriation bill.

A conference of representatives of the copper industry with the War Department officials is to be held on Thursday in another effort to dispose of the Government's stocks of copper and brass. In the meantime all sales, except in small quantities, have been held up. The copper situation is being complicated by the fact that the French Government also has considerable stocks of copper in this country, some of which is being disposed of at cut prices to the manufacturers to whom they were originally delivered.

Surplus in Foreign Lands

The War Department is endeavoring to work out a program of closer co-operation with the French, British and Italian governments on the question of the disposition of their surplus stocks in this country. An effort is being made to frame an agreement based upon the disposition which we are to make of our stocks in France and England. It is pointed out that our property in Europe is so much in excess of the materials held by foreign governments in this country that the latter should be willing to abide by any promise we might frame not to permit the disposition of such surplus materials to demoralize industrial conditions anywhere.

The special commission which is being sent to Europe expects to find a complicated situation there, particularly when it comes to attempting to dispose of the canals, docks, railroads and buildings built in France, which must of necessity be sold there. A question has also arisen over the disposition of automobiles in France. These cannot be sold there until they have paid the import duties, which, of course, were not levied upon them when they were sent over for use of the American Expeditionary Forces. If they are to be sold for private consumption, these duties of course would have to be paid.

None Shipped Back

An order has already been sent to the American Expeditionary Forces that no supplies of any kind are to be shipped back to this country. All must be sold in Europe.

The War Department published the following supplemental circular, issued by the Director of Purchase, Storage and Traffic:

The bureaus of the War Department are hereby authorized to sell without further reference to the Director of Sales any surplus property covered by the act of July 9, 1918, and War Department Bulletin No. 1, 1919, provided:

(a) That the sale or agreement to sell is made as an incident to the contract for war supplies or the settlement of such a contract which has been suspended or reduced, and has the approval of such contracting officer, board or higher authority, as may be required to approve such contracts or settlements, and

(b) That the proper sales officer or board of the bureau shall be consulted as to the terms, conditions and advisability of the sale or agreement to sell.

A full report shall be rendered to the Director of Sales, Office of the Director of Purchase, Storage and Traffic, immediately upon the completion of each such sale, showing the character of the property sold, to whom sold, the price received therefor and the purpose for which sold.

It is believed to be of advantage to the Government in the settlement of any contract to have the contractor retain as much as possible of the property involved, provided he will take it at a fair price. Any property that cannot be disposed of in this way becomes surplus and should be turned over to the Director of Sales for disposal. The Director of Sales is at all times ready to take over and dispose of such property if the contractor will not pay a fair price for it, and it is not the policy of the department to sell property to contractors who are known to intend to market it, or contractors who take it for speculative purposes and not for their own use.

German Pig-Iron War Output

German war-time pig-iron production by months has been made public, according to data published in the London *Iron and Coal Trades Review*. The last report of the German industry was that for September, 1916, published in THE IRON AGE, Dec. 21, 1916. After that no data appeared. The October, 1916, output was 1,161,005 metric tons, the largest for any month that year. The 1916, 1917 and 1918 production by months, so far made public, was as follows in metric tons

German Pig Iron Output by Months in Metric Tons

	1916	1917	1918
January	1,078,368	1,082,797	933,570
February	1,036,683	913,547	892,760
March	1,114,194	1,104,653	1,039,092
April	1,073,716	1,131,620	1,084,601
May	1,112,574	1,198,171	1,184,790
June	1,079,349	1,124,998	1,182,415
July	1,133,092	1,190,014	1,179,947
August	1,145,239	1,185,908	1,155,066
September	1,116,752	1,119,635	1,105,268
October	1,161,005	1,076,222	1,049,837
November	1,101,311	1,007,731	.....
December	1,101,955	976,891	.....
Total, 1916	13,250,000	13,140,000	.....
Total, 1915	11,790,000	.....	.....
Total, 1914	14,390,000	.....	.....
Total, 1913	19,210,000	.....	.....

The 1918 output began to show the drain of the war on man power and materials, the monthly output having shrunk from 1,116,000 tons per month for the first ten months of 1917 to 1,070,000 tons per month for the ten months of 1918. It is probable that the 1918 production average was materially lessened after the signing of the armistice. The pre-war or 1913 output was at the rate of about 1,600,000 tons per month.

The Engineering Council of the United Engineering Societies, 29 West Thirty-ninth Street, New York, has addressed a memorandum to the governors of all the States, urging the immediate organization of State Reconstruction Committees to promote the construction of public utilities, thereby taking advantage of the large number of skilled engineers and workmen now disengaged. It emphasizes also that manufacturers have at the present time a most favorable opportunity to add skilled engineering talent to their staffs.

Freyn, Brassert & Co., engineers, People's Gas Building, Chicago, will install two Brassert gas washing and drying units for the blast furnaces of the Detroit Iron & Steel Co., Detroit. Sixty-eight blast furnaces are equipped with these units.

WORKING ON PRICES

Many Complications in Bids on Plates and Shapes for the Navy

WASHINGTON, Feb. 25.—Officials of the Bureau of Construction and Repair of the Navy Department are still working out the prices of the bids on steel shapes and plates submitted last week for work on Battleships 49, 50, 51 and 52. The first two of these ships are to be built at the Brooklyn Navy Yard, the third at Norfolk, Va., and the fourth at the Mare Island yard, Cal. The schedules include a complicated series of items, and the work of making accurate comparisons between the various bids has been made more difficult by the fact that many of them include special stipulations concerning the method of applying freight rates and extras. After making allowances for these, however, the officials say that there is little real difference among the prices from the big steel companies that submitted bids on entire items. In some cases, smaller mills with limited capacity have stipulated that they can take care only of limited sizes. It is doubtful whether these will figure in the final awards, as Navy officials feel this would not be fair to the larger companies which have based their contracts on a distribution of work on a larger variety of items. These experts say that a review of the bids shows little real variation from a basic price of 3c. per lb. on plates and 2.80c. on shapes, f.o.b. Pittsburgh, except in the case of the bid submitted by R. C. Hofman for a Pennsylvania steel company of 2.95c. on plates. In several of the bids there seems to have been some question as to the actual inclusion of the 10c. per 100 lb. for Navy inspection, but apparently all doubts are being resolved in favor of a decision which will make the 3c. and 2.80c. prices respectively.

The total amount scheduled is only about 25 per cent of the material which will be needed for these ships, the contracts being just large enough to enable the Navy to lay the keels for the four ships by July 1 as required by the statute authorizing their building.

In a hurried transcription of the bids last week, the fact that the 3c. price bid by the Jones & Laughlin Steel Co. on the 9,700,000 lb. of medium steel plates for the two battleships at the Brooklyn yard was stipulated to be "f.o.b. Pittsburgh" was overlooked, thus apparently making it a bid 27c. lower than the competing bids. The "plate extras" also should have been added to the flange plate bids of the Midvale Steel & Ordnance Co. and the Brier Hill Steel Co. Almost every bid, however, carried a rider of some kind specifying technical exceptions, so that the Navy Department officials, who are not expert steel men, have had to make special computations to find the real basis for comparative awards. The Carnegie Steel Co. submitted an alternative bid on the whole schedule, in which it declared:

"If Navy Department prefers to purchase material f.o.b. mill, in order to obtain benefit of land grant rates in freight shipments, our prices would be as follows: Plates 3c., shapes 2.80c., bars 2.70c., all f.o.b. Pittsburgh."

This was intended chiefly to enable the Government to take advantage of cheaper freight rates to the Mare Island yard.

The Jones & Laughlin Co. added the following note to its bid: "Where we have indicated a base price on the various items, this procedure is rendered necessary because of lack of sufficient details to permit net prices being figured. To the base price in each case should be added extras in accordance with Standard Classification of Extras on Hot Rolled Products dated May 22, 1918, and revised Jan. 1, 1919, copy of which is attached hereto and made a part of this bid. Further our rates are f.o.b. Pittsburgh, and we expect pound prices regardless of the extended totals to govern."

The Midvale Steel & Ordnance Co. made the following stipulation: "The Standard Classification of Plate Extras of Jan. 1, 1919, calls for percentage extras on light plates. These percentages are to be figured on a base price exclusive of freight rates. The base delivered prices for plates are made from a price of 3c. base f.o.b. Pittsburgh, plus freight rate to destination. The percentage extras will, therefore, be taken from 3c. price, base, f.o.b. Pittsburgh." O. F. S.

Chairman Hurley Takes a Cheerful View as to Exports

CHICAGO, Feb. 25—(*By Wire*).—Edward N. Hurley, chairman United States Shipping Board, was the guest Feb. 22 of the foreign trade committee and the directors of the Illinois Manufacturers' Association, Chicago, the meeting being one of several arranged for different parts of the country to enable Mr. Hurley to obtain at first hand the export views of manufacturers. No publicity was given the meeting at Mr. Hurley's request, but it is understood he gave light of a very satisfying nature on the shipping situation.

It is unofficially reported that Mr. Hurley, after interviewing many ship owners on his recent trip abroad, became satisfied that the United States can operate its vessels as cheaply as any foreign nation with one exception. He assured the manufacturers that if they would get freight to the ports, on the Gulf or elsewhere, boats would be provided to carry it to foreign countries, and that the Emergency Fleet Corporation will meet the rates of any foreign merchant marine. He said existing conditions are not nearly as bad as they have been painted; that foreign ship owners are paying high wages to seamen, and that the La Follette law is not a bar to success.

Sheets in Demand for Automobiles

YOUNGSTOWN, O., Feb. 24.—Sheet mill rollings in the Mahoning Valley this week started at about 65 per cent of capacity. Sales departments are scurrying for what business is being placed, and the aggregate of the orders is maintaining mill schedules somewhat better than operators expected. Chief buying activity is by manufacturers of automobile bodies. Some export bookings are also being received in the district. Sheet bar business is in proportion.

Tin plate mills are filling good-sized orders for the Standard Oil Co., the product to go into containers. Conditions locally are a reflex of the situation throughout the country, but managers have thus far succeeded in averting any great amount of unemployment. Schedules have been reduced and men have not worked a full week in many cases, but employment has been well scattered. This has been the aim of manufacturers in the last two months.

Fabricators, such as the William B. Pollock Co., are engaged on repair work, overhauling blast furnaces and are keeping large forces of men at work. Officials of the Pollock company report heavy inquiries of this nature.

Furnace Plant Improvements

The American Manganese Mfg. Co. is contemplating extensive improvements to its blast furnace plant at Dunbar, Pa. Improvements made to the No. 1 stack include the erection of a new skip bridge complete, a furnace top structure including a distributor, new hoist engine, the enlargement of the tunnel filling system, a new direct discharge coke system and two special double truck scale cars. The furnace will be ready to operate within a few weeks. Improvements to the No. 2 furnace, which were recently completed, include a new bell operating rig and distributor. The work was done by Arthur G. McKee & Co., contractors and engineers, Cleveland.

Spanish-English editions of standard specifications for American products, prepared under the scheme of industrial co-operation with the Government and revised by the American Society for Testing Materials, have been issued by the United States Bureau of Foreign and Domestic Commerce. These bulletins include standard specifications of structural steel for locomotives, of structural steel for buildings, of carbon bars for railway springs, and of carbon steel forgings for locomotives.

ESTABLISHED 1855

THE IRON AGE

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Burdens of the Ore Producers

One of the very remarkable developments of the war period was the action of the then Director General McAdoo in June, 1918, in increasing the freight rate on iron ore from Minnesota mines to Lake Superior docks to $1 per gross ton, from the rate of 63½ cents, which had been in force since the spring of 1917. In fact, the Interstate Commerce Commission in 1915 ridiculed the contention of the Great Northern Railroad that 55 cents, then effective, was not a liberal rate. The so-called ore roads had prospered under the 55 cent rate, but the 63½ cent rate was allowed in 1917. The advance ordered by Director General McAdoo was made evidently with the desire to lend a helping hand to railroads in other parts of the country, whose rates were raised at the same time. It was a case of being consistent rather than of being just—giving a few railroads exorbitant earnings at the expense of the iron business. Under the dollar rate, the earnings ascended to astonishing figures, but the ore mining companies submitted to the higher charges, because they were regarded as a part of the program of winning the war. Now, however, they feel that the time has come to reduce the rate to at least 63½ cents, and the Minnesota Legislature has been asked to appeal to the Railroad Administration to give the desired relief, the reduction to take place prior to April 1, 1919.

The ore producers do not expect that this reduction in ore freights would result in their obtaining more for their ore. They realize that if the price of pig iron is to be reduced in harmony with the insistence of the pig iron melters and with public sentiment, the cost of ore must be reduced and they desire to avoid, as long as possible, reducing the wages of miners. They point to the tremendous earnings of the ore railroads, one of which led all the railroads of the country in its surplus rate per ton last year. They urge that, to assist in the readjustment, ore freight rates be put on a more reasonable basis.

Present conditions imperatively demand that, so far as possible, the cost of producing raw materials shall be reduced and that the producers of such materials shall not be unfairly treated. The ore producers of the Lake Superior districts not only are suffering from high cost of hauling ore, but are again threatened with the imposition of an unjust tonnage tax, as described elsewhere in this issue. Such a tax would in all probability result in reducing wages and curtailing production. A more inappropriate time could not be selected than the present for enacting such legislation.

Unrest in Britain and Here

The policy of the British Government in the matter of labor disputes is succinctly described, and roundly condemned, in a letter to the London *Times* by Edward V. Arnold of Bangor. The old time "Thunderer" had observed editorially that existing conditions were heading toward "economic disaster" and counseled patience. Mr. Arnold is not disposed to be patient in the circumstances. He points to Petrograd as the awful example. The facts are publicly known but are unfamiliar because few persons are willing to face them. A series of strikes is occurring and Mr. Arnold claims they are worked up by the party of "direct action." A strike is threatened almost instantly, whereupon the authorities make their choice between two methods, "which differ as Tweedledum from Tweedledee," the first being to grant the concession upon condition that the men continue work or go back to work, while the second is a requirement that work be continued pending settlement, the men knowing perfectly well that eventually the concessions will be granted. Mr. Arnold believes the whole trend is in the direction of substituting the Soviets or "the dictatorship of the proletariat" for the system of Parliamentary government. He asserts that while Lloyd George may speak at the peace conference in the name of Great Britain, "the broad fact remains that in home affairs he is at the mercy of Mr. Robert Smillie."

It is well recognized, of course, that what is called "industrial unrest" pervades the world. Some attempts have even been made to gage its relative intensity in different countries, in substance to seek to determine the percentage that such thought constitutes to the general thought of the people, and then arrange the various countries according to the percentages. All this is, as a matter of fact, suggestive of a wrong viewpoint. It assumes, consciously or unconsciously, that the

seeds of this unrest are much the same and the difference in the amount by which the plants thrive and propagate is determined by differences in soil. That is not the case. Human nature is much the same everywhere. The soil, in the mind of the worker, is not much different in Russia, in Britain or in the United States. It is the seeds that are different, also the surroundings. The analogy can be carried farther by observing that soils are much the same throughout the world, but in different sections very different seeds are planted, and climates vary widely, hence the varieties of vegetation.

Mr. Arnold asserts in his letter to the *Times* that these strikes in Britain are fomented chiefly by certain labor leaders who are disappointed at the results of the recent election. They sought to obtain certain victories at the polls, and failed, hence the present efforts which are calculated to subvert Parliamentary government. Here is a clear cut cause, a definite variety of seed. No such seed had been planted in Russia. The Russian uprising had a totally different origin. The Russian proletariat felt it had been brought into a war in which victory would not reward it and in which defeat would do it little harm.

Neither of these two varieties of seeds has been planted in the United States. The laboring people were for the war almost to a man, the few exceptions furnishing the clearest test of the rule, and they did not have any political issue in which they were defeated at the polls.

The danger, however, is no less great. What has been proved is that the soil of the human mind is fertile for the germination of seeds of this general character and the growth of the plants. An analogy is that the psychology of the mob is much the same irrespective of place or cause of formation.

Likewise the remedy is much the same. What Mr. Arnold points out as to the need in Great Britain is true of the United States. The supremity of the Government must be absolute and it must be made known to all that such is the case. It will not do for any class of men to get the idea that they have a special power or influence with the Government due to their belonging to that class, a power that is not defined or contemplated by the adopted form of government.

A belief of this sort arises from a multiplying of instances in which decisions relating to wages and conditions of employment are made along such a line that these classes of men conclude that they are being favored because they are what they are. The belief is particularly encouraged when men make claims that are partly bluff, naming terms from which they would recede in part, only to find the whole set of claims granted. Once the belief is established, the results follow, and they are much the same in all countries, because human nature is so much alike.

A very promising field looms up large for farmer-boy soldiers returning from the work of war. Farms of even less than a hundred acres are likely to be adapted to the use of motorized machinery. Tractor schools are becoming popular. State agricultural colleges, farm bureaus and like agencies are providing lecturers. Makers of machinery are exhibiting farm equipment and sending around their demonstrators. Manufacturing of machinery for the small farm is being arranged. Our Government by vocational education of the partially disabled among the returned soldiery is also doing its part along these lines. Work of this sort not only adds to the openings for employment at a time when employment openings are particularly welcome but promises a vigorous boost in the output and marketing of farm products and thereby some moderation if not an actual reduction in prices of such produce. From many points of view, patriotic and food cheapening included, there should be every encouragement for the training and the employment of farm mechanics.

Progress in Electric Steel

Interesting features have marked the progress of the American electric steel industry in the last two years. Statistics of the 1917 steel production, as collected by the American Iron and Steel Institute, show that the total output of electric steel ingots and castings was not far from double that of 1916, or 304,543 gross tons in 1917 as compared with 168,543 tons in 1916. It was more than ten times the 1913 production of 30,180 tons. About 79 per cent of the 1917 total, or 239,632 tons, covered electric ingots, and this was double the corresponding output in 1916. The increase in electric steel castings was not so large, having been a little more than 50 per cent greater in 1917 than in 1916, or 64,911 tons as against 42,870 tons. The ingot output was about twelve times and the steel casting about six times that made in electric furnaces in 1913. The data also show that the electric furnace has replaced the crucible so far as new installations are concerned, the 1917 crucible output having been less than in 1916.

A prominent feature of the 1917 output was that of alloy steels made in electric furnaces. Nearly 50 per cent of the total electric ingot production was alloy steels, or 129,282 tons out of 239,632 tons, a surprising revelation. The large war demand in that year for automobile, and later in the year for ordnance ingots explains this striking fact. Less than 2 per cent, or 1296 tons, of the electric steel casting output was alloy castings.

From a production viewpoint, the 1917 record, while noteworthy, is a disappointment to some because of the calculated greater capacity. But many of the installations were not producing until late in the year. The number of installations of new furnaces or plants in 1917 showed a gain of 97 furnaces, while in 1916 this gain was only 63, and yet the electric steel output in 1916 showed a much greater increase over 1915 than did that of 1917 over 1916. The expansion in number of furnaces in 1918, according to the annual review of the electric steel industry in THE IRON AGE, Jan. 2, 1919, was a net gain of 54 as compared with the 97 in 1917, and yet it is probable that the production in 1918 was much larger in proportion than in 1917. It is evident that the actual output and the increased number of furnaces show no corresponding relation.

The war has been the propelling force behind the expansion of this comparatively new industry.

Had the world conflict lasted only a few months longer the 1918 record of furnace installations would have shown a much larger growth. The same is true of the output. But war cannot be necessary to the growth of this industry. Some contend that its expansion in this country has stopped because electric power is too expensive under normal conditions. But consumers have been educated to the high quality of electric steel and its peculiar adaptability to certain conditions has been demonstrated. Perhaps its greatest future lies in the duplex or triplex processes. Certain it is that the process has come to stay, and will remain in some way. A portent of the future is that inquiry for such furnaces is now much more intensive than was expected some time ago.

Co-ordinating Power

Secretary of the Interior Franklin D. Lane has asked Congress for an appropriation of $200,000 with which to work out the details of a plan for a trunk line electric power system to cover the whole industrial region between Boston, Mass., and Washington, D. C. The purpose is to coordinate existing steam and water power and develop new water power on the rivers and new steam power at the coal mines, so that when there is plenty of water its power would supply the industrial and public service plants of the territory, and when water is low the steam plants, and especially those which it is proposed to create at the source of coal supply, would in their turn bear the burden.

The plan is in its infancy; it has taken no really definite form. But it can hardly be called visionary, for carried out it would only be giving Government assistance and impetus to what has already been accomplished in some parts of the eastern region, notably in New Jersey and particularly in New England where there exists examples of the interchange of steam and water power.

The New England Power Co. has developed large water powers on the Connecticut river and its tributaries in western Massachusetts and southern Vermont. The full measures of this energy is obtainable most of the time, but there are, of course, periods of drought when flow and storage are insufficient, and customers could not be supplied without the assistance of auxiliary steam plants. This power company instead of creating steam plants of its own enters into a contract with large users of power, under which they maintain steam plants but buy power developed at the company's hydraulic plants until that power falls off; then they in turn start up their steam plants and the company buys power of them. The company's profits lie in the fact that most of the time it is selling and not buying; the balance is strongly in its favor. Its customers, not only those with whom the reciprocal agreement exists, but others as well, average to get their power cheaper than could otherwise be the case.

The system has developed to include most of the steam plants, among them those of the public utility companies of central and western Massachusetts, Rhode Island and a large part of Connecticut, and a line is building which will tie in the great power stations of the Edison Company of Boston and the metropolitan district. From the main trunk lines extend laterals which feed power in all directions, and the scope of operations increases rapidly from year to year.

Secretary Lane's plan follows along almost identical lines. He hopes ultimately to cover all of the thickly populated parts of the country in the same way, but he would make a start with what he has named the North Atlantic Industrial District, in which he estimates the present generated power at 8,500,000 kilowatts, and the annual increase in demand for power at 500,000 to 1,000,000 kilowatts. He figures correctly that with a system such as he proposes steam power could be generated at the bituminous and anthracite coalfields at a tremendous saving over present cost in most of the district, especially in the remote New England, because of the elimination of the big item of transportation of fuel. The greater portion of the territory, though perhaps not the greater portion reckoned by population, does not even have water freight rates. New Jersey has a trunk line running from one end of the state to the other. Another is projected running between Boston and Fall River, Mass., its laterals feeding power to many important industrial communities. In fact New England is practically ready to hitch on to the great trunk line advocated by Mr. Lane, which, according to his plans, would extend across Massachusetts from Boston, down the Hudson from Poughkeepsie, and on through eastern Pennsylvania and Baltimore to Washington.

The problem of taking care of future power requirements is a very serious one, and of the important elements of the problem none is more important than that of railroad capacities. "A river of power" as the Secretary terms his trunk line would be an easy way of transporting fuel converted into electric energy.

A Recognition of Metallurgy

A distinctive and fitting recognition of metallurgical science has just been made. Last week the large and influential organization, the American Institute of Mining Engineers, at its annual New York meeting, voted a change in its name to include the metallurgical engineering phase of this society's work. The organization will hereafter be known as the American Institute of Mining and Metallurgical Engineers.

Probably no technical organization is more suitably called upon to bestow recognition of the large place held by the metallurgist than the mining engineers' organization. Not only does it number among its officers and members many of this country's most prominent metallurgists and metallographists, but the annual meetings of its iron and steel section have long been regarded as of the highest order in point of the papers presented and in the discussions elicited.

Additional appropriateness lies in the fact that the American Institute of Metals is now an important part of the larger organization. Metallurgy in the non-ferrous field is therefore to continue under

the patronage of those who have fostered its development.

Metallurgists and metallographists have taken an exceedingly large part in solving war problems. Some of these were divulged at the meeting by the representatives of the National Research Council. There are still revelations to come, and there is much yet for metallurgists to do. The future was never brighter, and it is a matter of gratification that so large a technical organization has given conspicuous recognition to a vital phase of its activities.

When all the opposition to a movement does not seem to hark back to partisan or class prejudice, one who is little informed on the subject needs to study it before taking sides. There is a widespread request on the part of the United States Employment Service to urge Congress to vote a large appropriation for continuing its activities. Organized to find men for jobs in the war emergency, it now essays to minimize unemployment, though it can hardly be expected to find jobs for men. Disregarding charges of its working partly to unionize labor, the least the uninitiated may do is to demand a convincing refutation of the claim that the cost per man placed is several times higher than the cost of placement among private employment and State employment agencies.

Sale of British War Supplies in the United States

The British War Mission is offering for sale a variety of steel products purchased and held in this country, including ship plates, angles, 6-in. shells (completed), steel billets, steel ingots, barbed wire, machine tools and tool steels, all of which is available for immediate delivery. This material is stated to be only a small percentage of similar supplies now being placed on the market by the United States. The British authorities state that in its disposal of this merchandise every precaution is being taken to protect American manufacturers by selling it gradually at current market prices. Recent reports that these war supplies were being dumped on the market are officially denied. On the other hand, assurances are given that the British War Mission is taking every reasonable precaution to protect manufacturers in this country.

Inquiries are invited, but quotations and specifications are obtainable only at the offices of the mission, 120 Broadway, New York; 1328 Chestnut Street, Philadelphia; and 605 Magee Building, Pittsburgh. All the products were subjected to the rigid requirements called for by British war contracts. Full specifications, together with analyses, tests, etc., are on record in the files of the mission.

It is reported that the success of British manufacturers in converting war products quickly into peace uses has materially reduced the surplus.

Plants Shut Down for Lack of Orders

YOUNGSTOWN, OHIO, Feb. 25—(*By Wire*).—The A. M. Byers Co., Pittsburgh, has suspended its plant at Girard, Ohio, this week for lack of business. The plant consists of 88 puddle furnaces, a plate mill and a bar mill.

The DeForest Sheet & Tin Plate Co. is also idle this week. It has adopted the policy of operating alternate weeks, allowing orders to accumulate one week to provide full employment the next.

Rumblings of labor trouble among foreigners in the steel mills of the Youngstown district are heard with more frequency and county authorities have made preparations for any emergency.

CONTENTS

Mr. Schwab on Business Conditions

There will be no immediate demand for iron and steel products on the part of France and Belgium, is the belief of Charles M. Schwab, chairman of the Bethlehem Steel Corporation, who arrived on the Olympic Feb. 24 after a brief visit to France. However, he thinks that reconstruction will develop ultimately. He is quoted as saying: "It is my opinion that this so-called reconstruction of France and Belgium cannot possibly be started for some time. As to the business development in our own country, I am an optimist and believe it will be very great, but I have been hopeful that some method might be found that legally would tide over temporarily the period of transition that is bound to be with us. I left business behind and took little interest in reconstruction work. It seems too early yet to begin, and because of this I see no immediate outlet for American iron and steel."

Iron and Steel Markets

NO GOVERNMENT AID ASKED

Trade Believes It Can Work Out Its Problems Without Intervention

Plates Cut $2 and Rivets $4—Current Orders Larger Than Appreciated

Steel producers do not look with favor on the proposed scheme of the Secretary of Commerce to "stabilize" prices on a lower plane. As stated before, it is more than a matter of price that is holding back business. Buying of copper in the face of repeated cuts has been negligible.

The industry believes that readjustment should be allowed to work itself out in a natural way. Slow though the necessary liquidation of war labor wage scales must be, what is regarded as the step likely to give quickest and most direct results is a relinquishing of Government control of food products and a reduction of living costs beginning in the kitchen.

Current demands for mill products have been larger in the aggregate than commonly appreciated. Those plants which have had to shut down outright or run in alternate weeks have worked off the back log of accumulated orders and others, even where 65 per cent of capacity is engaged, are now almost wholly on new bookings, which keep three to eight weeks' work ahead of the mills. It is those mills which are equipped more particularly to turn out railroad material or are not adapted to supplying the automotive trade which emphasize the light volume of buying.

Stocks in hands of producers are low, but distribution has not been effected by manufacturing consumers, notably the agricultural implement makers. Heavy buying is therefore not to be expected in the immediate future from such sources and it is argued that this distribution should not be embarrassed by injecting into it drastic price cutting questions.

The Government's price reducing plans are meanwhile being developed with the aid of arguments for co-operation and consultation of leaders of industry, which are strikingly similar to those denounced in past years as illegal.

Under the free play of buying and selling tactics, there is further evidence of price shading. In the matter of 3000 tons of plates, part of them for export to Canada, a cut of $2 per ton was made by three makers. Hard steel bars have been sold at a concession of $2. Recent sales at $5 below the market for billets and sheet bars have been for small lots.

Bolts and nuts, for which demand has fallen off, have been moved at about 5 per cent reduction, though firmly held in some market centers. Rivets are now quoted at $4 per ton below last week's levels. Several makers of tool steel have reduced prices 10c. per pound.

Several bids on 20,000 kegs of wire nails for the Government all named $3.50, the only variations being due to the figuring on the freight charges. The cut mentioned last week appears to have been named on stocks out of jobbers' warehouses.

A new step in the Government's policy as to prices has been taken quietly in the naming by the director of sales of the War Department of a price below which the Government will not negotiate for the sale of certain kinds of scrap.

Evidence accumulates that a large tonnage of semi-finished and finished material sold for export during the war and not shipped on account of inability to obtain vessels is being held in New York, and on a large part of this heavy warehouse charges have been piled up. In the case of 1000 tons of wire rods bought for France, it is stated that the price paid plus warehouse charges amounts to nearly double the present market price.

From Belgium inquiries have been received for 12,000 tons of billets and 1200 tons of sheet bars. A recent order for 50,000 boxes of tin plate for export is said to have been closed at slightly above the domestic price.

More than the usual amount of fabricated structural work is under consideration in the East. For 25 barges 3250 tons of steel will be needed.

No less than 4500 tons of alloy steel were bought in the Cleveland district for the automotive trade.

An item of railroad inquiry is 7500 kegs of nails for the Louisville & Nashville Railroad.

Pittsburgh

PITTSBURGH, Feb. 25—(*By wire*).

It is more generally accepted in the trade than ever before that prices on iron and steel products, from pig iron to finished steel, will have to be reduced before the trade is interested. How much of a reduction would be needed before consumers will be in a mood to come in the market and cover ahead for their needs is a good deal of a question.

On some lines of finished steel products, such as nuts and bolts, sheets and several other items, demand in the past week or 10 days has quieted down still more and the amount of buying of pig iron and finished steel seems to be growing steadily less, in spite of reports to the contrary. There has been a further slackening in blast furnace operations, and the amount of pig iron made this month will no doubt be considerably smaller than in the first 28 days of January. There is no new demand for billets or sheet bars, and reports are current of cutting in prices of as much as $5 a ton on some recent small sales. On finished steel products prices are being shaded more or less in certain districts with the exception of two or three items on which it is said prices are holding firm. The opinion seems to be that the readjustment process in the steel trade that has been going on for two months or more is going to take a longer time than expected when the readjustment started.

The scrap trade is still neglected, the prices tending downward, but it seems bottom has been reached in prices on coke, for the time being at least.

Pig Iron.—The local market is almost bare of inquiry and there is none in sight. A local consumer

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron per Gross Ton.	Feb. 25, 1919	Feb. 18, 1919	Jan. 28, 1919	Feb. 27, 1918
No. 2 X, Philadelphia‡	$36.15	$36.15	$36.15	$34.25
No. 2 Valley furnace†	31.00	31.00	31.00	33.00
No. 2, Southern, Cin'ti†	34.60	34.60	34.60	35.90
No. 2, Birmingham, Ala.†	31.00	31.00	31.00	33.00
No. 2 furnace, Chicago*	31.00	31.00	31.00	33.00
Basic del'd, eastern Pa.	33.90	33.90	33.90	33.75
Basic, Valley furnace	30.00	30.00	30.00	33.00
Bessemer, Pittsburgh	33.60	33.60	33.60	37.25
Malleable, Chicago*	31.50	31.50	31.50	33.50
Malleable, Valley	31.50	31.50	31.50	....
Gray forge, Pittsburgh	31.40	31.40	31.40	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Rails, Billets, etc. Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$55.00	$55.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	57.00
Bess. billets, Pittsburgh	43.50	43.50	43.50	47.50
O.-h. billets, Pittsburgh	43.50	43.50	43.50	47.50
O.-h. sheet bars, P'gh	47.00	47.00	47.00	51.00
Forging billets, base, P'gh.	56.00	56.00	56.00	60.00
O.-h. billets, Phila.	47.50	47.50	47.50	50.50
Wire rods, Pittsburgh	57.00	57.00	57.00	57.00
Finished Iron and Steel				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila.	3.145	3.145	3.745	3.685
Common iron bars, P'gh.	2.90	2.90	3.50	3.50
Iron bars, Chicago	2.92	2.92	2.97	3.50
Steel bars, Pittsburgh	2.70	2.70	2.70	2.90
Steel bars, New York	2.97	2.97	2.97	3.095
Tank plates, Pittsburgh	3.00	3.00	3.00	3.25
Tank plates, New York	3.27	3.27	3.27	3.445
Beams, etc., Pittsburgh	2.80	2.80	2.80	3.00
Beams, etc., New York	3.07	3.07	3.07	3.195
Skelp, grooved steel, P'gh.	2.70	2.70	2.70	2.90
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	3.25
Steel hoops, Pittsburgh	3.30	3.30	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire	Feb. 25, 1919	Feb. 18, 1919	Jan. 28, 1919	Feb. 25, 1918
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	4.70	4.70	4.70	5.00
Sheets, galv., No. 28, P'gh.	6.05	6.05	6.05	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh	5.00	5.00	5.00	4.00
Fence wire, base, P'gh.	3.25	3.25	3.25	3.25
Barb wire, galv., P'gh.	4.35	4.35	4.35	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$21.00*	$22.00	$23.00	$30.00
Carwheels, Philadelphia	23.00	23.00	23.00	30.00
Heavy steel scrap, P'gh.	*14.00*	15.00	16.00	30.00
Heavy steel scrap, Phila.	14.00	14.00	16.00	30.00
Heavy steel scrap, Chicago	14.50	14.50	15.50	29.50
No. 1 cast, Pittsburgh	*18.00*	19.00	21.00	30.00
No. 1 cast, Philadelphia	23.00	23.00	23.00	30.00
No. 1 cast, Ch'go (net ton)	**20.50**	19.50	20.50	26.75
No. 1 RR. wrot, Phila.	20.00	20.00	23.00	35.00
No. 1 RR. wrot, Ch'go (net)	14.50	14.50	15.75	31.25
Coke, Connellsville				
Per Net Ton at Oven:				
Furnace coke, prompt	$4.25	$4.25	$5.00	$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	5.00	5.00	5.00	7.00
Foundry coke, future	7.00	7.00	7.00	7.00
Metals				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*16.25*	17.50	20.00	23.50
Electrolytic copper, N. Y.	*15.50*	17.00	20.00	23.50
Spelter, St. Louis	*6.25*	6.35	6.75	7.75
Spelter, New York	*6.60*	6.70	7.10	8.00
Lead, St. Louis	**5.00**	4.70	5.00	7.10
Lead, New York	**5.25**	5.00	5.30	7.25
Tin, New York	72.50	72.50	71.50	85.00
Antimony (Asiatic), N. Y.	7.12½	7.12½	7.50	13.50
Tin plate, 100lb. box, P'gh.	$7.35	$7.35	$7.35	$7.75

has asked prices on 500 to 1000 tons of Bessemer iron for prompt delivery, and the Union Radiator Co., Johnstown, Pa., is in the market for 500 tons of foundry iron. There have been further restrictions in output of pig iron, and the blast furnace of the McKeefrey Iron Co., at Leetonia, Ohio, has gone out of blast until conditions in the pig iron trade get better. Some furnaces are piling iron as shipments are being held up, and further curtailment of output seems certain in very near future. Some resale basic and foundry iron is being offered in this market on the basis of $29 for basic and $30 for foundry, or $1 per ton under what are regarded as regular prices. So far as known, no resale Bessemer is being offered and prices seem firm. In the absence of any actual sales, nothing remains but to repeat last week's prices, which are as follows:

Basic pig iron, $30; Bessemer, $32.20; gray forge, $30; No. 2 foundry, $31; No. 3 foundry, $30.50; and malleable, $31.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Sheets.—It is said that at present the automobile trade is placing from 45 to 50 per cent of all new business that is coming to the sheet mills, and it is further stated that five or six of the larger mills that make sheets especially adapted for the automobile trade have their product pretty well sold up to July 1. The general demand for blue-annealed, black and galvanized sheets is only fair and is usually in small lots for prompt shipments. The feeling is strong in the trade that before long there will be a downward revision in prices of sheets and consumers are buying only such quantities as they must have to meet actual needs. At present independent sheet mills are said to be operating at close to 75 per cent, but some are running only 15 turns per week. In spite of the slack demand, prices on sheets are holding very firm, and recent efforts on the part of several buyers to have the sheet mills guarantee prices against decline, or to guarantee their own prices, have been refused. On a recent offer of several carloads of black sheets for April shipment, of which the intending buyer wanted the mills to guarantee prices against decline, this was absolutely refused in every case. It is said that any shading in prices of sheets, which is reported only from a few sections, is being done by jobbers and not by the mills. Mills prices on sheets are given in detail on page 586.

Ferroalloys.—While most producers of ferromanganese say their price on 70 per cent is $225 per gross ton delivered, they are not selling any material at this price, largely for the reason that consumers have stocks to carry them for some months and also because a good deal of ferromanganese is being offered for resale. It is said that some of this resale alloy has been offered as low as $150 per gross ton delivered. The same situation exists as regards 50 per cent ferro-silicon. Consumers are overstocked and are offering it freely for resale, as low as $100 per ton being reported as having been quoted by two or three consumers who desire to get rid of their surplus stock. Unless conditions in the steel trade soon improve, lower prices on ferroalloys seem certain.

We quote 70 per cent resale ferromanganese at $150 to $175, delivered, and 16 to 18 per cent spiegeleisen, $50, f.o.b. furnace, an addition or deduction of $3.50 per unit being made, when the manganese content is above or below the standard. Fifty per cent resale ferrosilicon is quoted at $100 to $125 delivered.

We quote 9 per cent Bessemer ferrosilicon at $52; 10 per cent, $54; 11 per cent, $57.30; 12 per cent, $60.60. We quote 6 per cent silvery iron, $39; 7 per cent, $40; 8 per cent, $42.50; 9 per cent, $44.50; 10 per cent, $47. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2.90 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—Producers of semi-finished steel say there is absolutely no demand for billets or sheet bars, and none is expected until new conditions in the finished steel market improve. There has been a heavy accumulation of sheet bars at some of the sheet and tin plate mills, and they have asked sources of supply to hold up shipments until this surplus steel has been worked off. It is said several small sales of slabs and billets were made recently at $3 to $5 per

ton under what are regarded as regular prices, but local steel makers say in the absence of demand there is no use quoting prices under the regular market, as they do not believe it would bring any business. We quote nominal prices on billets and sheet bars as follows:

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $43.50, sheet bars $47, slabs $46, and forging billets $56 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—There is no inquiry in this market. Three or four of the largest fabricators say there is no business offering and they are operating entirely on contracts placed some time ago, which will soon be cleaned up. The American Bridge Co. is building some steel barges at its Ambridge, Pa., works for the Carnegie Steel Co., which is giving this plant a higher rate of operation than it would otherwise have. Unless business soon comes on the market, some of the smaller fabricating plants will be entirely out of work. Railroads are doing little and occasionally place only a small order for necessary repair work. It is said the mills are holding firm for the official price, which is 2.80c. at mill Pittsburgh for beams and channels up to 15 in.

We quote beams and channels up to 15 in. at 2.80c. at mill, Pittsburgh.

Plates.—Local mills quoted last week on 20,000 to 25,000 tons of plates and shapes for four Government battleships and one fuel vessel, but awards have not yet been made. It is said that ruling market prices were quoted by all the mills on this pending business with the exception that a concession of $1 per ton was named by one Eastern mill on a part of the plates, the mill in question not rolling shapes. It is understood the Cambria Steel Co. has received instructions to proceed with the building of 3000 steel cars for the Pennsylvania Railroad placed a short time before the armistice was signed. There is strong hope that the Government will soon go ahead with its program for steel cars, rails and other track equipment, but so far nothing has been given out as to when these contracts may be placed. Some of the smaller plate mills are getting very close to the end of their orders, and will have to close soon unless new business develops. The larger plate mills are running at 50 to 60 per cent of capacity, with work ahead for six weeks to two months on this basis. We quote ¼-in. and heavier sheared plates at 3c. at mill, but there are reports that some mills would shade this price, if any new business were offered.

Iron and Steel Bars.—There seems to be no longer any question that iron bars have been offered on the basis of 2.70c. Pittsburgh, for Western delivery and 2.90c. for Eastern shipment. The two or three local mills that roll iron bars claim that so far they have not met these prices, but are not entering much new business. The market on re-enforcing steel bars is very much depressed, and some low prices are being made. The demand for steel bars is not urgent, being only for small lots to meet current needs, and specifications on contracts from implement makers and other consumers are not very active. As noted last week, prices on iron and steel bars are not uniform, especially on iron bars.

We quote soft steel bars rolled from billets at 2.70c.; from old steel rails, 2.80c.; common iron bars, 2.70c. for Western shipment and 2.90c. for Eastern shipment.

Tin Plate.—Orders being placed are only for small lots on which buyers want prompt shipment. As yet none of the large consumers, such as the can makers and others, is inclined to make contracts, believing there will be a reduction in price of tin plate in the near future, possibly by April 1. Some mills making tin plate are operating to only about 50 per cent, and others are running from 85 to 90 per cent. Export inquiry is heavy, coming from France, Italy, Japan and China, and with the lower ocean freights a good deal of export business in tin plate is looked for by the mills to be placed in the very near future. It is said a recent order for upwards of 50,000 boxes of tin plate for export shipment is divided between two American mills at somewhat higher than the domestic price. We continue to quote tin plate for domestic use and for delivery in first half of this year at $7.35 per base box, Pittsburgh. Prices on terne plate, for which the demand is very dull, owing to light building operations all over the country, are given on page 586.

Wire Rods.—Makers report that the demand for wire rods has fallen off a good deal lately, due no doubt to the dull conditions existing in the wire trade, as many small buyers of rods who draw them into wire are running their plants very light, and are not placing orders for rods. Export inquiry is fairly active, mills stating they quote often on foreign inquiries, but very little business results. Three or four fair-sized sales of rods have recently been made for delivery in Canada. Prices of rods are given in detail on page 586.

Wire Products.—It is stated that the American Steel & Wire Co. was the lowest bidder on the 20,000 kegs or more of wire nails asked for by the Government for delivery at the different navy yards. All the makers quoted on the base of $3.50 per keg, base f.o.b. Pittsburgh, but there was a slight variation in prices named in bids by the makers, owing to the different ways the freights were figured. It is not known now whether the contract will be placed with the American Steel & Wire Co., the feeling being in the trade that the Navy Department will likely get its nails from the Government, which reported some time ago a large amount of nails on hand. Makers report the demand for nails and wire is light, being only for small lots to cover actual needs. However, it is said that jobbers' stocks are being steadily reduced, and if this is true there should be, in the near future, a heavier demand for both nails and wire from the jobbers. One local mill received last week specifications for about 3500 kegs of nails for the Government, on which it named prices on Nov. 15. It is said prices are being held. Stocks of wire and wire nails are accumulating pretty fast in the warehouses of the mills, due to the dull demand. Prices on wire products are given in detail on page 586.

Hot-Rolled Strip Steel.—Makers report the demand as a little better in the past week or two, and considerably heavier than for cold-rolled strip steel. Mills are operating only to about 50 per cent of capacity, and are accumulating some stock. Specifications are still coming in on old contracts, on which shipments were not completed last year. It is said prices are being firmly held.

We quote hot-rolled strip steel, as made by hoop and band mills, at 3.30c. per lb., while for deep stamping or drawing quality steel, 50c. per 100 lb. extra is charged, all f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Mills report the demand as light, being only for small lots to meet actual needs. None of the consumers is making contracts, but buying only as actual needs require, and the mills are not anxious to make contracts under present conditions. It is said prices are being held, in spite of the small amount of business being placed.

We quote cold-rolled strip steel at $6.25 base per 100 lb. f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker hard tempered in coils under 0.20 carbon. Boxing charge 25c. per 100 lb.

Rivets.—In spite of reports to the contrary, no reduction in price of rivets has been formally made by the rivet makers, but it is known that recently prices have been shaded about $4 per ton in some districts, or to a basis of $4.20 for button head structural rivets and $4.30 for cone head boiler rivets. Local makers say they are not meeting these prices. The demand is very quiet, consumers buying only such quantities of rivets as they must have to meet actual needs.

We quote button head structural rivets at $4.20 and cone head boiler rivets at $4.30 base, f.o.b. Pittsburgh.

Nuts and Bolts.—No important action was taken at the meeting of the Institute of Nut, Bolt and Rivet Manufacturers, held in its rooms in the Oliver Building, this city, on Wednesday, Feb. 19. Present trade conditions were fully discussed. The demand is light, being only for small lots to cover actual needs, and there has been some shading. Discounts on nuts and bolts are given in detail on page 586.

Shafting and Screw Stock.—Fully 25 per cent or more of the demand for shafting is coming from the automobile trade, the demand from implement makers and from the screw stock machine trade being light. Consumers are buying only in small lots to meet actual needs. The surprising thing is that prices have held so firm in spite of the light demand, makers claiming that discounts are being rigidly observed. None of the makers of shafting or screw stock is operating more than 40 to 50 per cent of capacity.

We quote cold-rolled shafting at 21 per cent off list in carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

Spikes.—The Louisville & Nashville Railroad is in the market for 7500 kegs of standard spikes for delivery up to September, this being the first inquiry of any note from railroads for some time. The Baltimore & Ohio recently placed an order for 3000 kegs for prompt delivery with a local maker. The general demand for spikes of all kinds is light, and none of the makers is operating to more than 50 per cent of capacity. It is said that prices are being held.

We quote standard spikes, 9/16 x 4½ in., at $3.65, and small spikes at the same price in carload lots of 200 kegs or more at $3.65 per 100 lb., plus usual extras. We quote boat spikes at $5.00 base per 100 lb. plus usual extras in carload lots of 200 kegs or more, all f.o.b. Pittsburgh.

Hoops and Bands.—The demand is quiet and only for small lots to meet actual needs of consumers. No new contracts are being made, and none of the mills rolling hoops and bands is operating to more than 50 to 60 per cent of capacity.

We quote steel hoops and bands at 3.30c. base, with the usual extras.

Wrought Pipe.—The Western oil and gas companies, notably in the Texas and Oklahoma fields, are buying quite freely of line pipe for various gas and oil lines to be laid this year and new inquiry for line pipe is quite heavy and makes up a good part of the new business entered by the mills. Demand for merchant pipe is very dull, very little being placed. Mills report an active demand for oil country goods and are booked up for several months. Development of new oil territory this year promises to be heavy, and the mills look for an active demand over the entire year for oil country goods. It is said pipe mills are operating 80 to 90 per cent, but a good part of the output is going into stock at various distributing centers throughout the country. There are still persistent reports of a material reduction in price of both iron and steel pipe, to be made effective about April 1, but nothing official on this is given out. However, the trade looks for lower prices on other lines of finished steel, and pipe is no exception in this respect. Discounts on iron and steel pipe, which the mills state are being held, except by jobbers in some districts, are given in detail on page 586.

Boiler Tubes.—The demand for locomotive tubes is better, some orders for locomotives having been recently placed. The demand for merchant tubes is very dull, and only for small lots for actual needs. Discounts on iron and steel tubes are given on page 586.

Coke.—General conditions in the coke trade show no change and it is believed prices have probably reached bottom. There has been a still further decrease in output of coke, many of the smaller, high-cost coke plants having shut down, being unable to make coke at the lower prices now ruling and come out even. There is a good deal of variation in prices of standard furnace coke, which range all the way from $4.25 up to $5 per ton at oven. One Valley blast furnace has contracted for its March coke on the basis of $4.25 per net ton at oven. A good deal of coke loaded on cars, which has to be moved, is still being sold at the best prices that can be obtained. We quote standard brands of 48-hr. blast furnace coke at $4.25 to $5 per ton at oven, while 72-hr. foundry coke is quoted at about $5 per net ton at oven. Output of coke in the upper and lower Connellsville regions for the week ending Feb. 15 was only slightly over 200,000 tons, a decrease from the previous week of nearly 25,000 tons, and the lowest output in the two regions in any one week for several years.

Old Material.—The local scrap trade seems to be steadily going from bad to worse and prices on nearly all grades of steel are declining. Dealers report there is no demand from consumers except for an occasional small lot, and about the only sales being made are of scrap material located on cars which has to be moved to save demurrage charges and for which dealers accept any prices they can get. Consumers seem to have the advantage entirely and are often able to pick up odd lots of scrap at extremely low prices. One local dealer secured about 1200 tons of scrap contained in the recent B. & O. list, but the heavy steel scrap is said to have been bought by consumers direct. We have again reduced prices on neary all grades of scrap and now quote in gross tons of 2240 lb. delivered to consumers' mills in the Pittsburgh district and to other consuming points that take Pittsburgh freights as follows:

Heavy steel melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$14.00 to $15.00
No. 1 cast, for steel plants (nominal)	18.00 to 19.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	15.00 to 16.00
Compressed steel	11.00 to 12.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.00 to 12.00
Bundled sheet stampings	11.50 to 12.00
Railroad grate bars	15.00 to 16.00
Low phosphorus melting stock	19.00 to 20.00
Low phosphorus bloom and billet ends and heavy plates	21.00 to 22.00
No. 1 busheling	13.00 to 14.00
Iron car axles	32.00 to 33.00
Locomotive axles, steel	31.00 to 32.00
Steel car axles	33.00 to 34.00
Railroad malleable	14.00 to 15.00
Machine shop turnings	8.00 to 8.50
Cast iron wheels	22.00 to 23.00
Rolled steel wheels	18.00 to 19.00
Sheet bar crop ends (at origin)	20.00 to 21.00
Heavy steel axle turnings	11.00 to 12.00
Heavy breakable cast	19.00 to 20.00
Cast iron borings	9.50 to 10.00
No. 1 railroad wrought	18.00 to 19.00

Brass Manufacturers Meet

At a meeting of the National Association of Brass Manufacturers, Chicago, Feb. 21, William M. Webster, commissioner of the association, submitted a report on the victory which was gained by the association and trade organizations in general in the Federal action in which he and others were defendants, having been indicted for alleged violations of the Sherman law.

The trial began before Judge Learned Hand in New York and lasted over one month. The jury was out less than 20 minutes, and returned a verdict finding all the individuals and corporations named not guilty. The organization directly concerned was the Automotive Equipment Association. The brass manufacturers view the verdict as a victory for all trade associations and passed a resolution expressing its appreciation of Mr. Webster's fight. It was stated that the verdict recognized the right of reasonable trade reciprocity, so long as no attempt at price fixing was made.

President Harry E. Speakman presided at the meeting. The consensus of opinion of those present, some 24 firms being represented, was that not much activity can be expected in the brass business until about July 1. It was regarded as doubtful if building can be well started before that time, but in the latter half of the year it is expected that business will be good. Mr. Speakman reported on the movement to create an association or allied board in the plumbing and heating trades, and the association approved the furtherance of such a body.

Steps were taken toward the elimination of such products as are obsolete, one member stating that in going over his records he found that 85 to 90 per cent of his business was done on nine to 12 articles.

The meeting was polled as to the hours worked by employees of members per day, and whether bonuses were paid, with the following results: Eight, 10 hr.; thirteen, 9 hr.; two, 9½ hr.; one, 8 hr. Three pay bonuses and 20 do not.

Chicago

CHICAGO, Feb. 25—(*By Wire*).

Not much change in the actual new demand for iron and steel can be recorded, but a little improvement is detected. Some buyers are becoming a little restive, apparently believing they may have waited too long before providing for their second quarter needs, this being particularly true in sheets. At the same time, they have not been moved to buy. An inquiry from France is for 6000 tons of billets, and some Canadian inquiry is for plates, shapes and billets. A fair sized shipment of screw spikes has been shipped to South Africa from this district, the price being well in excess of what domestic consumers pay. The leading interest continues to run full in all save its electric steel department. The leading independent sees rolling for its plate and bar mills through March, but not beyond at the present influx of orders. The leading local independent will conduct its export business on an independent basis and is expectant of a good trade through gulf ports, this being dependent, however, on shipping facilities being furnished by the Emergency Fleet Corporation. To New Orleans it has the advantage of a water rate most of the way.

Secretary Redfield's plan for bringing about prices which will initiate buying is the subject of much discussion. How it can operate without conflicting with the Sherman law is much questioned, but it is generally agreed that any workable scheme that will start buying is to be encouraged, especially if the idea is to cause activity to start without an abnormal decline in prices, as the latter could not take place without, temporarily at least, greatly curtailing employment.

Officers of the American Steel & Wire Co. emphatically deny that there has been any reduction in the base price of wire nails, asserting that at the mill price of $3.50 per keg, Pittsburgh, but little or no profit exists for any maker.

Pig Iron.—Except for occasional taking of small lots, the market continues extremely quiet. A large percentage of the melters are active in striving to have deliveries suspended, and the attention of distributers is largely given to readjustment of contracts. Sellers report good progress in coming to an understanding with their customers. Some small lots of choice iron—high silicon, high manganese and low phosphorus—are being offered, but sales ensue only after much digging on the part of the sellers. The iron is being offered on the basis of $31, f.o b. Chicago, for silicon, 1.75 to 2.25 per cent, the manganese differentials being waived in some instances. Little resale iron is appearing, but plenty of it could be obtained were there demand for it. Only one southern furnace now refrains from offering on the $31 base.

The following quotations are for iron delivered at consumer's yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$38.70 to $39.00
Lake Superior charcoal, C to AA	40.70 to 42.50
Lake Superior charcoal, No. 6	41.20 to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	32.25
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	31.00
Northern high-phosphorus foundry	31.00
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	39.00
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	37.25
Southern foundry, silicon, 1.75 to 2.25	36.00
Malleable, not over 2.25 silicon	31.50
Standard Bessemer	32.20
Basic	30.00
Low phosphorus (copper free)	52.50
Silvery, 7 per cent	45.80 to 47.00

Structural Material.—Canadian interests are inquiring for shapes as well as plates, but the general situation is but little changed and will not be until building activity develops. The leading independent producer is running its 28-in. mill, which formerly was rolling shell steel, but there is not enough call for its output for it to operate efficiently. The Llewellyn Iron Works will supply 402 tons required for a United States marine railway at the naval fuel depot, San Diego, Cal. The Western Pipe & Steel Co. will fabricate two riveted pipe lines, containing 711 tons, for the city of Los Angeles, Cal.

The mill quotation is 2.80c., Pittsburgh, which takes a freight rate fo 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.07c. for material out of warehouse.

Ferroalloys.—The makers of ferromanganese for the most part are maintaining a firm attitude, but there is no business, and if any appeared, $175 delivered could be done. Ferrosilicon is quiet also quotations of various makers not being in line. Some resale Bessemer ferrosilicon has been placed, but practically no resale standard ferromanganese is offered.

We quote 70 per cent ferromanganese nominal at $175 delivered; 50 per cent ferrosilicon at $125 to $150, delivered and 16 to 18 per cent spiegeleisen at $60 furnace.

Cast-Iron Pipe.—Orders which are impending include 4000 tons for Detroit and 600 tons for Akron, Ohio. Fort Wayne, Ind., will take bids March 10 for 1144 tons. Chicago has placed 325 tons with the United States Cast Iron Pipe & Foundry Co.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $64.80; 6-in. and larger, $61.80; class A and gas pipe, $1 extra.

Plates.—New business is coming in slowly and not fast enough to permit any accumulation of orders. The leading independent sees enough in sight to keep its mill busy through March. Some inquiry for plates is coming from Canada.

The mill quotation is 3c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.27c. for plates out of stock.

Bars.—In concrete reinforcing bars a little increased activity, but mild steel and iron bars show no change. One steel bar maker has sufficient orders to last well into March, but shipments exceed incoming orders.

Mill prices are: Mild steel bars, 2.75c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.90c. Chicago; refined iron bars, 3.65 to 4.40c.; rail carbon, 2.80c., Pittsburgh.

Wire Products.—It is emphatically denied by the leading interests that there has been any reduction in the price of wire nails, as was reported in the East a week ago. On the contrary, makers have assured their trade that no decline was probable in the near future, as they are making little or no profit on wire nails at the present basis of $3.50 per keg. For prices, see finished iron and steel, f.o.b. Pittsburgh, page 586.

Bolts and Nuts—Chicago.—Automobile makers are buying heavily for the next three months and are closing with unusual promptness. The tractor makers are fairly active, but the implement makers are covered and not doing much buying. Large producers are maintaining prices on carriage and machine bolts, but small makers have made concessions. Local demand consists of innumerable small orders for prompt delivery. A general improvement is seen with a consequent tendency for prices to harden. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 586. Jobbers quote:

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to ⅜ x 4 in., 40 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅜ x 6 in., 35 off; larger sizes, 20 and 5 off; box pressed nuts, square topped, 78c. off; hexagon tapped, 57c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are cancelled.

Sheets.—Consumers are beginning to show some concern over their second quarter needs. Though unable to accumulate orders, the mills receive enough to keep them busy; in fact, the amount of business is called surprising in view of conditions.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.17c.; No. 28 black, 6.22c., and No. 28 galvanized, 7.57c.

Mill quotations are 4.70c. for No. 28 black, 3.95c. for No. 10 blue annealed, and 6.05c. for No. 28 galvanized.

Rails and Track Supplies.—Some excellent orders for track fastenings were placed last week, and some of the roads whose rail needs are not covered have been given to understand by the Railroad Administration that they will soon be permitted to place orders.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3c., Pittsburgh and Chicago; tie plates, iron, 3.30c., f.o.b. maker's mills. The base for light rails is 3c., f.o.b. maker's mill, with usual extras.

Old Material.—In general the market is as quiet as ever, although there has been a little interest shown in rolling mill grades, and melting steel can be sold at $15. Cast scrap continues the strongest feature. The

Chicago, Milwaukee & St. Paul and the Chicago, Rock Island & Pacific have unclosed lists, the latter offering 3000 tons for re-rollers, but these are weak and in but little demand. For No. 1 busheling, an advance of 50c. has been paid over last week's quotations.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$21.00 to $22.00
Relaying rails	45.00 to 50.00
Carwheels	21.00 to 22.00
Steel rails, rerolling	15.00 to 15.50
Steel rails, less than 3 ft.	15.50 to 16.50
Heavy melting steel	14.50 to 15.00
Frogs, switches and guards, cut apart	14.50 to 15.00
Shoveling steel	13.50 to 14.00
Per Net Ton	
Iron angles and splice bars	$18.00 to $19.00
Steel angle bars	13.00 to 14.00
Iron arch bars and transoms	20.50 to 21.50
Iron car axles	24.00 to 25.00
Steel car axles	21.00 to 22.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	7.50 to 8.00
Cut forge	13.50 to 14.00
Pipes and flues	11.00 to 11.50
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	13.50 to 14.00
Steel knuckles and couplers	17.50 to 18.00
Coil springs	18.00 to 18.50
No. 1 cast	20.50 to 21.00
Boiler punchings	17.50 to 18.50
Locomotive tires, smooth	16.00 to 17.00
Machine-shop turnings	5.00 to 6.00
Cast borings	6.50 to 7.00
Stove plate and light cast	15.00 to 15.50
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00
Railroad malleable	14.00 to 15.00
Agricultural malleable	13.50 to 14.00
Country mixed	9.00 to 10.00

Philadelphia

PHILADELPHIA, Feb. 25.

Sellers of pig iron and steel products find that consumers, almost without exception, are staying out of the market because of expectations of lower prices. Sellers, however, do not agree that cuts in prices would stimulate business. They fear that any announcements of lower prices would merely intensify the hesitation among consumers and make the situation really worse than it is to-day. Exporters declare that considerable foreign business, which might be closed, if prices were lower, is being held back because American prices do not compete with British prices, when freight rates are taken into consideration.

Many rumors are afloat as to lower prices being quoted on pig iron and steel, but such reports are difficult to confirm. If shading of prices is going on, it is being done surreptitiously. No leading producers of either pig iron or steel products are making any formal cuts, with the single exception that a Pennsylvania company offered plates to the Navy Department at 2.95c., base, Pittsburgh, in a bid last week for battleship steel. Owing to the confusing way in which bids were submitted, the impression was created that other steel companies had also cut the price, but a later analysis of the figures discloses that all other bids were on a 3c. base price, the misinterpretation arising from the different methods of quoting extras. In one case a Pittsburgh mill quoted a Pittsburgh base price, without freight rate and extras, thus making it appear on the surface as if its bid was much below the regular market.

Business has come almost to a standstill, and operations at Eastern steel plants are showing further gradual curtailment. One Eastern plant making semi-finished steel, sheets and plates, will be down below 50 per cent operation next week, and will blow out one of its blast furnaces. Plate mill operations average from 50 to 60 per cent in this district, and some mills have, at the most, only enough business for a few weeks.

The scrap market continues dull and weak, except for a flurry in blast furnace borings and turnings, due to large purchases by an Eastern consumer at $10.50 per ton, delivered, about $2 a ton higher than had been paid for small lots by another Eastern consumer only a few days before. Ferromanganese, 70 per cent, is reported to have sold as low as $160, this being resale material, while 1500 tons of resale spiegeleisen, 18 to 22 per cent, is being offered by brokers at $45. Pig iron is very dull, and orders are few and only for small lots. No basic iron has been sold in this market for a month.

Exports inquiries lead exporters to believe that eventually a good foreign trade in steel products will come. Among inquiries are two from Belgium, one for billets and another for sheet bars, and eastern Siberia is inquiring for tin plate. Exporters say that they expect Great Britain and Japan will come into the American market soon for large tonnages of basic pig iron, but pig iron merchants have no information supporting this expectation.

Pig Iron.—More reports are heard of eastern Pennsylvania furnaces selling on an actual f.o.b. furnace basis, but such reports usually emanate from consumers. A Johnstown, Pa., consumer is said to have been quoted a delivered price of $32 on No. 2 plain foundry. A few of the smaller eastern Pennsylvania furnaces will undoubtedly sell now in disregard of the Pittsburgh basing, but the principal producers continue to adhere to that way of quoting. A New York exporter offers for resale 10,000 tons of Buffalo iron, 2.25 to 3.25 per cent silicon, at $30.10, base, Buffalo, if taken in one lot or at $30.25, base, in 500-ton lots. In basic iron there has not been a sale of importance in the past month. Some furnaces are piling just enough iron to take care of the orders they have on their books and will then blow out. On firm offers it is conceded by sellers that the prices quoted below for delivery in Philadelphia and vicinity would be shaded, this being particularly true of foundry grades.

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$36.15
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	34.90
Virginia No. 2 X (2.25 to 2.75 sil.)	36.35
Virginia No. 2 plain (1.75 to 2.25 sil.)	35.10
Basic	33.90
Gray forge	33.90
Standard low phosphorus	51.90
Copper-bearing low phosphorus	48.90

Ferroalloys.—Carload lots of resale ferromanganese, 70 per cent, have been disposed of at $160. Other sales have been made at about $175. Producers continue to quote $225, but of course are not doing any business. About 1500 tons of resale spiegeleisen, 18 to 22 per cent, is being offered by brokers at $45 per ton.

Coke.—Best grades of Connellsville furnace coke for prompt delivery have been offered to Eastern furnaces at $4 per ton, Connellsville. A few carloads of foundry coke have been sold at $5.50 to $6, Connellsville.

Billets and Sheet Bars.—Among export inquiries are two from Belgium, one for 12,000 tons of billets and another for 1200 tons of sheet bars. Whether American mills can get this business in the face of British competition is considered problematical. We quote open-hearth rerolling billets at $47.50, Philadelphia.

Plates.—Reports of the bids on plates opened by the Navy Department on Feb. 18 seem to have been somewhat confused owing to the lack of uniformity in the method of bidding. Some mills bid base prices, with the usual extras, while others added the extras and submitted complete prices. Representatives of some of the steel companies which submitted bids declare that only one mill, a central Pennsylvania company, cut below 3c., base, Pittsburgh, its price being 2.95c., base. There are many reports of cuts in prices, but actual sales on a basis lower than 3c., Pittsburgh, are difficult to trace. Eastern plate makers are operating at a 40 to 60 per cent rate. None of the leading producers will admit that a reduction of any kind has been given on current business. We quote sheared plates at 3.245c., Philadelphia.

Structural Material.—No new projects are coming before the fabricators, whose shop operations have been greatly curtailed. Structural mills are engaged mostly on old orders for ship and car shapes. We quote plain material at 3.045c., Philadelphia.

Bars.—Practically no bar iron business has been taken by the mills since prices were reduced. Bar iron mills are not operating at more than 50 per cent of

capacity. Steel bars are in fair demand from jobbers. One steel company reports that the bulk of its entire steel demand is in bars. We quote soft steel bars at 2.945c.; common merchant bar iron, 3.145c.; refined bar iron from selected scrap, 3.895c., and best refined iron, 4.145c., all delivered Philadelphia.

Sheets.—Though sheet business has been somewhat better than in most finished lines, a dropping off is now noted, and an Eastern maker has curtailed operations on blue annealed. Prices continue unchanged as follows: No. 10 blue annealed, 4.145c.; No. 28 black, 4.495c.; No. 20 galvanized, 6.295c., all Philadelphia.

Old Material.—The Bethlehem Steel Co. came into the market last week for several thousand tons of blast furnace borings and turnings, most of which were bought at $10.50, delivered. This was $2 a ton higher than was paid by another Eastern consumer for small lots only a few days before. There have been practically no sales of other grades of scrap and the market continues dull and weak. The War Department will establish minimum selling prices on its accumulations of iron and steel scrap. We quote for delivery at consumer's works, eastern Pennsylvania, as follows:

No. 1 heavy melting steel	$14.00 to $15.00
Steel rails, rerolling	17.00 to 17.50
No. 1 low phosphorus, heavy, 0.04 and under	20.00 to 22.00
Iron rails	24.00 to 25.00
Carwheels	23.00 to 25.00
No. 1 railroad wrought	20.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	17.00 to 18.00
No. 2 busheling	13.00 to 14.00
Turnings (for blast furnace use)	9.50 to 11.00
Machine-shop turnings (for rolling mill use)	11.00 to 12.00
Cast borings (for blast furnace use)	9.50 to 11.00
Cast borings (clean)	13.50 to 14.00
No. 1 cast	23.00 to 24.00
Grate bars	18.00 to 20.00
Stove plate	18.00 to 20.00
Railroad malleable	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications)	17.00 to 18.00
Ungraded pipe	14.00 to 16.00

Birmingham

BIRMINGHAM, ALA., Feb. 24.

Pig Iron.—One large furnace interest reports that the inquiry, especially for foreign business, has been greater than since Jan. 1. While bookings were not made, it is indicated that there is a fair prospect of business for export. Sales for domestic consumption have been for small lots. The all-around basis, with one exception, is $31, and this price might be shaded on some resale metal. Stocks increased about 10,000 tons in January and, even with reduced output, they will probably increase this month. A lot of iron, especially basic, has been left on hands of producers by war industries, whose contracts were canceled and shut down pending resumption of work on peace-time products. Some of this iron is on the market for resale. The basic output is now restricted to the two concerns that consume basic. The Woodward Iron Co. has only two stacks in operation, both on foundry. It is not at all unlikely that a large furnace company will blow out two stacks in the very near future, that being under consideration at this time. The Holt furnace of the Central Coal & Iron Co. has resumed operations, probably due to the revival of activity in the pipe trade incident to the near approach of spring. The steel output situation in the district has not materially changed. We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

Foundry, 1.25 to 2.25 silicon	$31.00
Basic	30.00

Cast-Iron Pipe.—Actual pipe business has increased and prospective business is brighter. The leading interest took the five miles of piping for the Birmingham Water Works for extensions in the Tennessee company's industrial neighborhood. Several southwestern municipalities and lumber concerns have placed orders recently.

Coal and Coke.—The steam coal market has softened here and there and coke is becoming easier under the impact of offerings from as far north as Pennsylvania in competitive fields. There have been no reductions in foundry coke.

Old Material.—The scrap market has been dealt another blow by the consuming interests, resulting in a kind of deadlock. Very little business is being transacted on the new low prices, which have reached the bottom. We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Old steel rails	$10.50 to $11.00
No. 1 heavy melting steel	10.00 to 10.50
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.00 to 6.50
No. 1 cast	19.00 to 19.50
Carwheels	19.00 to 19.50
Tramcar wheels	18.00 to 18.50
No. 1 wrought	18.00 to 18.50

Buffalo

BUFFALO, Feb. 24.

Pig Iron.—The market is still lagging, with very little life or spirit manifest. Consumers of the district are not buying any iron except as they absolutely need a certain analysis, and then purchase probably only one or two carloads. Most of them apparently have sufficient stock on hand to cover current needs, and await developments before buying future requirements, even to a limited degree, evidently believing there is a possibility of a falling off in prices at which iron can be obtained in a not distant period. It is entirely a waiting market so far as new business is concerned, and furnace output is going forward solely on prewar contracts booked some time ago. So far as reported, none of the furnaces of the district is piling iron. One Buffalo interest with a three-stack plant has one stack out for relining. The price schedule is as follows: f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25, silicon	$34.00
No. 2 X, 2.25 to 2.75, silicon	32.25
No. 2 plain foundry, 1.75 to 2.25, silicon	31.00
Gray forge	30.00
Malleable silicon not over 2.25	31.50
Basic, 1 to 1½ per cent mng	30.50
Basic, 1½ to 2½ per cent mng	31.00
Bessemer	32.20
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.50

Finished Iron and Steel.—In spite of the recurring statements that prices are going to be reduced, orders are being placed for small tonnages for quick shipment, steel bar material and small shapes being the principal lines asked for. Canadian trade in particular shows a little improvement over the week previous. Efforts are being made by purchasers to obtain assurance from sellers that prices will be guaranteed against decline before date of shipment. This suggestion, however, has not met with the approval of sellers, although an action of that kind on the part of producers would undoubtedly bring out considerable tonnages for emergency uses and rush shipments, as there is evidence that a good many users are short in some lines, but they are waiting until they actually need material before they order it. Specifications on old orders are being deflected to new requirements.

Old Material.—The market is exceedingly dull, with very little business coming in from local consumers, practically none, in fact. Heavy melting steel, which has been nominally quoted at $14.00 to $15.00 for the past two weeks, has sagged still lower, and dealers now say that not more than $12 can be obtained for it. Mills and foundries keep out of the market, and the attenuated amount of business going appears to be entirely between dealers. There was some inquiry for stove plate last week by dealers to apply in filling old orders, but it proved to be very difficult to collect more than a small tonnage of it. Lack of trading prevents the establishment of more than a nominal

schedule. We quote dealers' asking prices as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades	$12.00
Low phosphorus, 0.04 and under	$19.00 to 20.00
No. 1 railroad wrought	18.00 to 19.00
No. 1 machinery cast	21.00 to 22.00
Iron axles	23.00 to 24.00
Steel axles	23.00 to 24.00
Carwheels	21.00 to 22.00
Railroad malleable	19.00 to 20.00
Machine shop turnings	7.00
Heavy axle turnings	13.00 to 14.00
Clean cast borings	8.00 to 10.00
Iron rails	21.00 to 22.00
Locomotive grate bars	16.00 to 17.00
Stove plate	17.00 to 18.00
Wrought pipe	13.00 to 14.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stamping	11.00 to 12.00

British Iron and Steel Market

American Competition Felt — Labor Position Checking Business—Ferromanganese Weak

(By Cable.)

LONDON, ENGLAND, Feb. 25.

America is able to sell steel all over the world £5 below British prices, according to a statement in the House of Commons during a debate on the mining commission bill. The Board of Trade has so notified steel makers. In asking for an explanation it was stated that all orders are going to America owing to high wages and increased cost of materials and commodities.

The tin-plate output is increasing with export prices easy and with America offering c.i.f. here below home trade official price.

Pig-iron output is much below requirements and the big neutral demand remains unsatisfied. The labor position is very serious and is a check to business everywhere. The demand for galvanized sheets is very poor at £29 10s. ($140.15) basis. The ferromanganese market has a weak undertone and a reduction is expected. Many collieries are working at a loss.

The German pig-iron returns now exclude occupied territory. For December the output was 430,000 metric tons and for November 516,000 tons.

It will require the John Cockerill Works in Belgium three years to regain its pre-war position.

Following are the government fixed prices for steel per gross ton except where otherwise stated, f.o.b. makers' works, the figures in parentheses being the official domestic prices and the others the official export prices:

Hematite pig iron: East Coast, £8 12s. 6d. (£6 2s. 6d.); West Coast, £8 17s. 6d. (£6 7s. 6d.).
Ship, bridge and tank plates, £16 10s. (£14).
Boiler plates, £17 10s. (£15).
Ship, bridge and tank plates, thin, £19 10s. (£16).
Small angles, tees and flats, £20 (£16 10s.).
Beams, £16 2s. 6d. (£13 12s. 6d.).
Rails, 60 lb. per yd. and upward, £15 10s. (£13 7s. 6d.).
Rounds, squares and hexagons, £17 10s. (£14 5s.).
Billets and slabs for rolling, £13 10s. (£11 12s. 6d.).
Billets and slabs for forging, £15 (£12 15s.).
Bar iron, £20.
Tin plate, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 40s. to neutral countries; otherwise, 33s. 3d.
Tin plate bars (£12 5s. 9d.).

(By Mail)

Export Drawbacks—Great Labor Unrest—Reconstruction Retarded—London Steel Exchange

LONDON, ENG., Feb. 3.—The general industrial position is far from satisfactory because of the labor unrest, particularly in the engineering and shipbuilding sections. In many cases, disorders have arisen, particularly in Glasgow. The instigators of these troubles are apparently what are known as the shop-stewards, but the hand of the notorious organization known as the Clyde Workers Committee appears to have been at the back of it.

Meanwhile from another quarter come the demands of the miners, which are full wages from state funds for miners released from the army but not absorbed in the mines, and for men displaced from the mines to make room for ex-soldiers; the amendment of the eight hours act by the substitution of six working hours for eight; and a 30 per cent advance on present earnings other than war wages, the war wages to be continued. It is not yet known whether they are going to get what they ask or not. It is interesting, however, to note that it is estimated that an addition of 30 per cent to the present wages would add between £35,000,000 and £45,000,000 to the wages bill of the mines. Obviously the increased costs of coal would affect many other industries, and in consequence of this and of the labor unrest itself, enterprise is being checked in many directions. At the same time, the reorganization of plants so that they may undertake peace-time work instead of war supplies in some shape or form, retards the reconstruction of industry generally.

An interesting development in the iron and steel market has been the establishment of an exchange in London. Hitherto that city has not enjoyed the advantages in this respect which many provincial and continental cities possess, in having a common meeting place where those interested in the iron and steel and allied industries could meet and transact business. There is, of course, the London Metal Exchange which, however, specializes in the non-ferrous metals. The objects of the new exchange may be summarized as follows: To maintain a suitable meeting place in London for those engaged in the industries named; if necessary to adjust controversies between the members; to establish just and equitable principles in those trades; to maintain uniformity in rules, regulations and usages; to adjust standards of classification; to disseminate useful information connected with the industry throughout all markets, and generally to promote the interests of the iron and steel and allied industries.

As regards the Cleveland pig iron market business is held up by the scarcity of foundry qualities which is accentuated by the coke shortage. This not only affects the output, but also the quality of the iron. Consumers are anxious to bring their stocks up to datum lines before the subsidies are withdrawn and prices rise, but at present the prospects are poor for getting anything better than hand to mouth deliveries. Forge iron is, however, more or less plentiful and good sales are reported.

With reference to steel, the position is confused and complicated as regards prices.

The export position seems to get worse instead of better owing to the subsidy question and the cancellation of contracts involved. A new list has been issued by the Government, of export drawbacks, payable on iron and steel material exported on and after Feb. 1, 1919. They are as follows:

	Per Ton £	s	d
Steel plates (ship, bridge, tank, boiler, chequer, etc.) ¼ in. thick and up	2	10	0
Steel plates (under ¼ in. thick down to and including ⅛ in. thick)	3	10	0
Re-Rollers:			
Over 3/16 in. down to and including ⅛ in., one size and thickness	0	15	0
Steel angles and sections	2	10	0
Small steel angles, tees, flats, channels and joists under 6 ft. x 3 ft.	2	0	0
Steel joists 6 ft. x 3 ft. and upwards	2	10	0
Steel rounds, squares and hexagons	3	5	0
Small rounds square and hexagons	2	0	0
Steel rails 50 lb. per yd. and over	2	2	6
Steel rails under 50 lb. down to and includnig 45 lb. per yd.	1	7	6
Steel rails under 45 lb. per yd.	1	10	0
Steel hollow bridge rails 45 lb. per yd. and over	1	10	0
Rails, second hand, all sections	3	0	0
Steel blooms and billets (special quality)	2	5	0
Steel blooms and billets (ordinary quality)	1	17	6
Steel plate cuttings (re-rolling)	1	17	6
Sheet bars and tin plate bars	1	5	0
Bar iron of all kinds, including iron puddled bars, rolled and sheared strip and iron plates	2	15	0
Pig iron except cold blast	2	10	0
Cold blast pig iron	1	15	0

The drawback is subject to deduction of cost of putting f.o.b. plus 2s 6d per ton in all cases except bar iron, puddled bars, rolled and sheered strip and iron plates, where the drawback is net.

New York

NEW YORK, Feb. 25.

Pig Iron.—In spite of the fact that many of the inquiries coming from foreign countries are indefinite and come from doubtful sources, there is an excellent prospect of some iron being sold for export at an early date. Bonafide inquiries from Italy and Belgium are still in the market from melters who have not found prices satisfactory and apparently are persisting in the hope that they can obtain more favorable quotations. This is taken as an indication that England is not able to satisfy the demand from Italy and Belgium. The appearance in this market of 10,000 tons of Buffalo iron being offered for sale by a dealer not well known in the trade at 75c. below the prevailing price has aroused interest, but no one seems anxious to buy the iron. The domestic demand is very light. Some large foundries are reported as operating on a hand-to-mouth basis. A leading seller of Southern iron is about to blow out two stacks on account of the limited demand. We quote prices as follows for tidewater delivery for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25	$37.90
No. 2 X, silicon, 2.25 to 2.75	36.15
No. 2 plain, silicon, 1.75 to 2.25	34.90
No. 2 X, Virginia, silicon, 2.25 to 2.75	36.65
No. 1 Southern, silicon, 2.75 to 3.25	41.70
No. 2 Southern (all rail), silicon, 2.25 to 2.75	39.95
No. 2 Southern (all rail), silicon, 1.75 to 2.25	38.70

Ferroalloys.—Ferromanganese has been sold both by consumers and by one or two producers in small lots aggregating several hundred tons, at $150, delivered, which for the first time in many weeks established a quotation. Demand is, however, very light and only for immediate needs, which was the case in the quantities sold. There has been some inquiry for export and offers have been made at $150, but it is understood that these did not bring any business, the consumer buying probably from British makers. It is interesting to compare this fact with the statements in British trade papers to the effect that Continental consumers must pay from $290 to $300, delivered, for the British alloy. As compared with a price of $150 to American consumers the British domestic price is about $130, delivered. The nominal quotation for spiegeleisen, demand for which is still very light, is $50 to $53, delivered, depending upon the quantity and the analysis. About 1500 tons of resale material, 18 to 22 per cent, was offered at $45, but it is understood that no transaction has thus far resulted. Ferrosilicon, 50 per cent, is nominal at $100 to $125 per ton, delivered, with demand light and considerable resale alloy available.

Finished Material.—A cut of $2 a ton on 3000 tons of plates has been made to a large consumer by three Eastern independent mills. The first quotation of 2.90c., base, Pittsburgh, was made by a Delaware mill, which took a considerable part of the tonnage for domestic shipment. The remainder was taken by an export company for shipment to Canada, the order being divided between two mills. The plates were mostly in wide sizes, 120 in. or over, and delivery is to be made of the entire tonnage this week and next. A Japanese inquiry for 10,000 tons of plates in desirable sizes is in the market and the exporter who is attempting to place the business claims he is standing out for a 2.70c. quotation. A Staten Island shipbuilding company is in the market for about 1800 tons of plates for 30 barges. Otherwise, plate business is dull, being confined mostly to small lots for prompt delivery. The Navy Department is asking for bids again on about 6200 tons of fabricated steel for a structural shop at the Mare Island Navy Yard. Bids on this material were received several months ago and rejected. The American Bridge Co. has taken an order for a 900-ton bridge from the Southern Railway. The Lackawanna Bridge Co. has received an order for 400 tons for seven small buildings to be erected by the Temple Malleable Iron & Steel Co., Temple, Pa. The New Departure Mfg. Co., Bristol, Conn., will build a factory addition, for which about 350 tons of steel will be required. No action has been taken by the New York City Board of Education on 1100 tons for two schoolhouses in the Bronx. Post & McCord, New York, have received the contract for the barge canal terminal at Greenpoint, Long Island, involving 300 tons. Export trade is almost at a standstill. Freight rates continue high, despite the fixing of rates by the United States Shipping Board, as space is not always available on ships controlled by the board. Shipments to Buenos Aires, Argentina, have stopped owing to a dock strike at that port which has tied up about 100 cargo-laden vessels in the harbor. Exporters believe that labor conditions in the British iron and steel industry are more serious than generally reported in the press, and they expect that some business may come to this country through inability of England to furnish steel. A meeting of the Bolt, Nut and Rivet Institute was held in Pittsburgh last week. None of the participants would own to planning any immediate change in prices. Reduction of bar iron prices has not been effective in bringing out business. The report that the Donner Steel Co. had closed down its steel plant is denied. One blast furnace at Buffalo and one at Tonawanda, N. Y., are out of blast, leaving one on at each place, while the finishing mills are being operated intermittently as orders materialize. The 14-in. bar mill is on this week and will continue all of next week and the 84-in. plate mill was put in operation on Monday. We quote mill shipments as follows: Steel bars, 2.97c.; shapes, 3.07c.; plates, 3.27c.; common bar iron, 3.17c.; refined bar iron, from selected scrap, 3.92c., and best refined iron, 4.17c., all New York. Out-of-store prices are as follows: Steel bars, 3.97c.; structural shapes, 4.07c.; plates, 4.27c.; No. 10 blue annealed sheets, 5.17c.; one-pass cold-rolled black sheets, No. 28 gage, 6.22c.; No. 28 galvanized sheets, 7.57c.; hoops, 4.57c.; bands, 3/16 in., Nos. 10 and 12, 4.57c.; shafting, plus 9 per cent off list.

Cast-Iron Pipe.—The taking of bids on 1500 tons for Bayonne, N. J., has been delayed until March 14, and no other tonnage of importance has appeared. The market is extremely dull. Prices for 6-in. and heavier are $62.70, New York; for 4-in., $65.70; for 3-in., $72.70, and $1 additional for class A and gas pipe.

Old Material.—More sales have been made by scrap dealers and brokers than a week ago. In particular, No. 1 machinery cast has been purchased by foundries in New York and Brooklyn, several of the consumers paying as high as $24, delivered. Some demand has been caused for mixed borings and turnings, thus giving a little boost to prices, but the point of delivery is so far away as to cause freight rates to reduce profits to a large extent. Scrap men are interested in the report of the Government fixing minimum prices for old material which it has for sale. Prices dealers and brokers are quoting per gross ton, New York, are as follows:

Heavy melting steel	$9.50 to $10.00
Rerolling rails	12.50 to 13.50
Relaying rails, nominal	47.00 to 50.00
Iron and steel car axles	19.00 to 21.00
No. 1 railroad wrought	17.00 to 18.00
Wrought-iron track	12.00 to 13.00
Forge fire	9.00 to 10.00
No. 1 yard wrought, long	15.00 to 16.00
Light iron	5.00 to 6.00
Cast borings (clean)	9.50 to 10.50
Machine shop turnings	6.50 to 7.50
Mixed borings and turnings	6.00 to 7.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	12.00 to 13.00
Stove plate	15.00 to 17.00
Locomotive grate bars	13.00 to 14.00
Malleable cast (railroad)	13.50 to 14.50
Old carwheels	21.50 to 22.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$22.00 to $24.00
No. 1 heavy cast (columns, building materials etc.), cupola size	20.00 to 22.00
No. 1 heavy cast, not cupola size	16.00 to 17.00
No. 2 cast radiators, cast boilers, etc.)	15.50 to 16.50

The iron-ore output in Luxemburg in 1918 was 4,509,150 tons against 6,752,200 tons in 1916, according to statistics recently published. The 1913 output was 7,333,372 tons. These contrast with 5,007,457 tons in 1914 and 6,130,434 tons in 1915.

St. Louis

ST. LOUIS, Feb. 24.

Pig Iron.—Business on pig iron remains very dull, with only here and there a small sale of some special lot, either because it is wanted for some special purpose or because its analysis offers the buyer something that he wants at the moment. There is still no disposition to enter the market on future contracts, although the furnaces have all come to the reduced price agreed upon some weeks since. At the same time, the consumers are watching the situation closely with a view to entering the market as soon as they are convinced that it is fully stabilized and that they can take contracts for their products without danger of variation of prices in raw material thereafter. An optimistic feeling prevails and the general belief that with the opening of spring business will be active. In the meantime, all are playing safety first, although most consumers are taking in contracted pig iron.

Finished Iron and Steel.—In finished products there is increasing interest and a growing tendency to buy, though there is as yet no great movement to contract ahead for material. The architects' boards have not begun to show the effects of the figuring that is under way, and while new construction is expected with the spring it is not likely to develop so early as would normally be the case, because of the conditions prevailing. Movement out of warehouse continues fair and there is no weakness of price being shown.

For stock out of warehouse, we quote as follows: Soft steel bars, 4.04c; iron bars, 4.04c; structural material, 4.14c; tank plates, 4.24c; No. 8 sheets, 5.19c; No. 10 blue annealed sheets, 5.24c; No. 28 black sheets, cold rolled, one pass, 6.29c; No. 28 galvanized sheets, black sheet gage, 7.64c.

Old Material.—The scrap market continues in a dull and listless state, neither consumers nor dealers being inclined to do any business for forward periods in the present state of affairs. Consumers are also disposed to be severe in inspection of material already under contract or to impose embargoes where their supplies in the yards are of good size. Both sides of the market are playing a waiting game, and are doing no business other than that which is imperative. There is occasional trading among the dealers for lots required to meet contracts that are being filled, but nothing is occurring to make a market and in consequence the quotations made continue to be estimates and even guesses at values rather than actually justified figures due to transactions.

	Per Gross Ton	
Old iron rails	$22.00 to	$23.00
Old steel rails, rerolling	16.00 to	17.00
Old steel rails, less than 3 ft.	16.50 to	17.00
Relaying rails, standard sections, subject to inspection	40.00 to	45.00
Old carwheels	22.00 to	22.50
No. 1 railroad heavy melting steel	14.50 to	15.00
Heavy shoveling steel	14.00 to	14.50
Ordinary shoveling steel	13.00 to	13.50
Frogs, switches and guards, cut apart	14.50 to	15.00
Ordinary bundled sheet scrap	9.00 to	9.50
Heavy axle and tire turnings	8.00 to	8.50
	Per Net Ton	
Iron angle bars	$17.00 to	$17.50
Steel angle bars	15.00 to	15.50
Iron car axles	24.00 to	24.50
Steel car axles	23.00 to	23.50
Wrought arch bars and transoms	19.00 to	19.50
No. 1 railroad wrought	15.00 to	15.50
No. 2 railroad wrought	14.00 to	14.50
Railroad springs	15.50 to	16.00
Steel couplers and knuckles	15.50 to	16.00
Locomotive tires, 42 in. and over, smooth inside	13.00 to	13.50
No. 1 dealers' forge	11.50 to	12.00
Cast iron borings	8.00 to	8.50
No. 1 busheling	12.50 to	13.00
No. 1 boilers cut to sheets and rings	8.00 to	8.50
No. 1 railroad cast	16.50 to	17.00
Stove plate and light cast	12.00 to	12.50
Railroad malleable	12.00 to	12.50
Agricultural malleable	11.00 to	11.50
Pipes and flues	11.00 to	11.50
Heavy railroad sheet and tank	10.00 to	10.50
Railroad grate bars	12.00 to	12.50
Machine shop turnings	7.00 to	7.50
Country mixed	11.00 to	11.50
Uncut railroad mixed	12.00 to	12.50
Horseshoes	13.50 to	14.00

Cincinnati

CINCINNATI, Feb. 25—(*By wire*).

Pig Iron.—No signs of any revival are to be noted, and, in fact, market conditions are probably quieter than they were last week. However, consumers are now taking iron on their old contracts about as fast as it is due, and very few hold-up requests are being received. The consumption of basic iron is said to be falling off, but the reduction, if any, in the melt has not been sufficient to cause any comment. There is at present no talk of any reductions in prices because furnaces are not at all confident that lower prices would bring out any business. They also claim that production costs would prohibit any lowering of present prices without causing losses. Lake Superior charcoal iron is firm at the last Government schedule, but not much is being sold. The melt of the stove foundries shows some improvement but is by no means up to standard.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, No. 1 foundry and 1 soft	$35.85
Southern coke, No. 2 foundry and 2 soft	34.60
Southern coke, No. 3 foundry	34.10
Southern No. 4 foundry	38.85
Southern gray forge	33.60
Ohio silvery, 8 per cent silicon	49.30
Southern Ohio coke, No. 1	34.05
Southern Ohio coke, No. 2	32.80
Southern Ohio coke, No. 3	32.30
Southern Ohio malleable Bessemer	33.30
Basic, Northern	31.80
Standard Southern carwheel	51.60

Finished Material.—There have been no late changes in wholesale prices, although jobbers of machine screws have lately received reductions from the manufacturers that will cause a change in quotations on such products within a very short time. There is an excellent demand for boiler and tank plates and shipments from the mills are coming forward promptly. Both black and galvanized sheets are dull and the mill price on No. 28 black sheets is 4.70c., and on galvanized 6.05c., Pittsburgh basis, with a freight rate of 23c. to Cincinnati. Jobbers' quotations on sheets vary too much to arrive at an average price. The wholesale hardware dealers report a very good business in both barbed wire and wire nails, although slack building operations have cut down consumption of nails to a considerable extent. The following are local jobbers' prices:

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 10 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.25½c., and wire nails, $4.15 per keg base.

Old Material.—Prices do not yet seem to have reached the bottom, and it is only the absence of business that prevents a further marking down of all kinds of scrap. It is rumored that the railroads will have a large amount of scrap to offer some time soon, and in fact dealers are already receiving lists that indicate the tonnage available from this source of supply may soon be considerable. There is practically no market for cast-iron borings and steel turnings. The following are dealers' prices f.o.b. cars Cincinnati and southern Ohio in carload lots:

	Per Gross Ton	
Bundled sheet	$9.50 to	$10.00
Old iron rails	24.50 to	25.00
Relaying rails, 50 lb. and up	40.00 to	41.00
Rerolling steel rails	15.00 to	16.00
Heavy melting steel	13.50 to	14.00
Steel rails for melting	14.00 to	14.50
Old carwheels	15.50 to	16.00
	Per Net Ton	
No. 1 railroad wrought	$13.50 to	$14.00
Cast borings	5.00 to	5.50
Steel turnings	5.00 to	5.50
Railroad cast	15.50 to	16.00
No. 1 machinery	17.50 to	18.00
Burnt scrap	11.00 to	11.50
Iron axles	25.00 to	25.50
Locomotive tires (smooth inside)	15.00 to	15.50
Pipes and flues	10.50 to	11.00
Malleable cast	11.00 to	11.50
Railroad tank and sheet	9.00 to	9.50

Coke.—The Wise County, Pocahontas and New River producers apparently have decided not to change quotations at the present time, and some of these operators

have shut down their ovens rather than take on business below their previous quotations. New River operators are still quoting a nominal figure of $8 per net ton at oven on both furnace and foundry coke. Wise County furnace coke is unchanged at $7, and foundry around $8. Connellsville coke is weak, and some 48-hr. fuel for prompt shipment has been sold as low as $4.50. However, the average quotation is around $5 per net ton at oven, with foundry grades bringing $6 to $6.50. Practically all new business at the present time is for coke to be shipped promptly and for filling in purposes.

Cleveland

CLEVELAND, Feb. 25.

Iron Ore.—An Ohio consumer has purchased a small lot of resale Bessemer ore that was on a Lake Erie dock. This sale was made at the last Government price effective during the last quarter of 1918. There are also two inquiries from Eastern furnaces for Bessemer ore on Buffalo docks, one of these inquiries for 5000 tons and the other for a smaller lot. So far as is known, no resale Bessemer is available at Buffalo. No inquiries are coming out for this season's ore. We quote, f.o.b., lower Lake docks, as follows:

Old range Bessemer, $6.65; old range non-Bessemer, $5.90; Mesaba Bessemer, $6.40; Mesaba non-Bessemer, $5.75.

Pig Iron.—A Columbus, Ohio, consumer is inquiring for 2000 tons of malleable iron for shipment during the remainder of the first-half. This is the first domestic inquiry of any size that has developed for several weeks, and will give producers an opportunity to show how much cut, if any, they are willing to make in prices. All buying recently has been in such small lots that producers have not been tempted to quote lower than regular prices. It is stated that no quotations lower than regular prices were made on the recent export inquiries. No new export inquiries are reported. Some activity in foundry iron is expected next month, as it is estimated that about 40 per cent of the smaller foundries in this territory will need some additional iron for the second quarter. It is believed that few, if any, of the larger foundries will need additional iron. Reports from the foundries in the Central West indicate that the foundry melt is at about the same rate as a month ago. In spite of the light operations, some of the furnace companies continue to ship nearly all of their iron, and it is evident that a great deal of this is being piled in foundry yards. A few car lot sales of Southern iron are reported at regular prices. We quote, f.o.b. as follows:

Bessemer	$33.60
Basic	30.40
Northern No. 2 foundry	31.40
Southern No. 2 foundry, silicon, 2.25 to 2.75	37.25
Gray forge	30.40
Ohio silvery, 8 per cent silicon	46.90
Standard low phosphorus, Valley furnace	51.00

Coke.—Many foundries are holding up shipments on Connellsville foundry coke until they can secure price adjustments. While many of the contracts provide that the last Government price should prevail should price restrictions be removed, the consumers are insisting that they be given the advantage of the present prices. Some of the by-product plants in the Central West have readjusted foundry coke prices to $6.50 for February shipment. A clause in these by-product coke contracts provide for a readjustment to prevailing market prices in case Government price regulation was removed. Standard grades of Connellsville foundry coke are quoted at $6 per net ton at oven. A sale of some Wise County, Va., coke has been made at $6.50, for early shipment.

Bolts, Nuts and Rivets.—Some price shading has developed in the bolt and nut market. It is stated that concessions in most cases do not exceed 5 per cent. The demand is still light, although February orders improved a little over January. The automobile manufacturers have been buying freely, but no business is coming from the railroads. There is now an open market on rivets and a sharp competition among the manufacturers for orders. While there has been no formal revision of prices, the maximum market price is now well established at 4.20c. Pittsburgh for structural rivets and 4.30c. for boiler rivets. Shading of these prices is expected. Demand is light. Manufacturers have not decided what, if any, action they will take on revision of old contracts to the new prices.

Tool Steel.—Several leading manufacturers of high speed tool steel have further reduced prices 10c. a lb. and now quote this steel at $1.80 per lb. This is a 20c. reduction as compared with the Government price. One manufacturer recently reduced the price on this steel to $1.50 per lb.

Finished Iron and Steel.—Orders for finished steel are light, the volume of business being about the same as during the few previous weeks. The proportion of orders to inquiries is lower than normal owing to the hesitancy of buyers about making commitments because they expect prices to drop. Consequently orders are only for immediate requirements. Alloy steel is more active than carbon steel, and inquiries for this steel during the week aggregate 4500 tons, a portion of which has been placed. This demand is entirely from the automotive industry. Some question has been raised as to whether the Emergency Fleet Corporation orders with Lake shipyards will be canceled, but it is now authoritatively stated that all of the boats Lake shipbuilders have under contract will be built, keeping their yards busy until next fall. The mills will complete rolling the steel for these boats within a few weeks. Small Lake shipyards are bidding on Government inquiries for 25 canal barges which will take 3250 tons of steel. Semi-finished steel is in light demand. Finishing mills lacking orders are specifying only for very limited quantities on contracts placed early in January, leaving some sellers with few actual orders. Producers generally are not meeting the cut reported last week of $5 on slabs made to Cleveland consumers. While there are no confirmed reports of price cutting by mills on finished steel, some producers are reported to be selling shafting, spikes and other finished material in less than carload lots at car lot prices. Rerolling mills have commenced to cut hard steel prices. These prices are being shaded $2 per ton from the 2.70c. base in this territory, and sales at a $4 per ton concession are reported in the East. There is no demand for bar iron and local rolling mills are shut down as far as bar iron orders are concerned, although they are kept partly busy converting steel for the automobile manufacturers. Warehouse prices are as follows:

Steel bars, 3.87c.; plates, 4.17c.; structural material, 3.97c.; No. 10 blue annealed sheets, 5.07c.; No. 28 black sheets, 6.12c.; No. 28 galvanized sheets, 7.47c.

Old Material.—Scrap prices have declined further on several grades but show some tendency to stay near present levels on some of the grades on which declines have been most pronounced. Heavy melting steel is apparently not more than 25c. lower than a week ago, dealers now quoting this grade from $13.50 to $14.50. Quotations on turnings have not changed, but borings have declined about 50c. and one lot of 500 tons offered at $9.75 has found no takers. Producers continue to sell material at the best prices they can get and dealers are buying heavy melting steel for yard stocks at as low as $11 to $12. Local mills are holding back on shipments of a great deal of material. Dealers' prices delivered to consumers' yards in Cleveland and vicinity are as follows:

Heavy melting steel	$13.75 to $14.25
Steel rails, under 3 ft	15.00 to 15.50
Steel rails, rerolling	15.00 to 16.00
Iron rails	23.00 to 24.00
Iron car axles, nominal	30.00 to 31.00
Steel car axles, nominal	30.00 to 31.00
Low phosphorus melting scrap	13.75 to 14.25
Cast borings	9.50 to 10.00
Iron and steel turnings and drillings	7.00 to 8.00
Compressed steel	11.50
No. 1 railroad wrought	17.00 to 18.00
Cast-iron car wheels	15.50 to 16.00
Agricultural malleable	13.00 to 14.00
Railroad malleable	14.00 to 14.50
Steel axle turnings	12.00 to 12.50
Light bundled sheet scrap	8.00 to 9.00
No. 1 cast	20.00 to 21.00
No. 1 busheling	14.00 to 14.50
Railroad grate bars	13.50 to 14.00
Stove plate	13.00 to 13.50

IRON AND STEEL STOCKS

Steel Issues Generally Advance Following Activity in Other Specialties

NEW YORK, Feb. 24.

The market reacted fairly steadily upward the past week. Steel company shares in nearly every case showed increases of varying amounts. Gulf States Steel common advanced 4⅝ points; but most issues were inside a 2-point range. United States Steel common gained 2¾ points; but the preferred lost ½ point. The trend is attributed in some quarters to a reported increase in buying for shipment abroad.

The range of prices in active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	34 - 35⅞	Int. Har. pf.	115⅞-116
Allis-Chalm. pf.	84½- 87½	Lackaw. Steel	66 - 67
Am. Can com.	44¾- 46½	Lake Supr. Corp.	20½- 21¼
Am. Can pf.	101 -101¾	Midvale Steel	41¾- 43
Am. Car & F. com.	88½- 91⅞	Nat.-Acme	30
Am. Car & F. pf.	115 -116	Nat. En. & St. c.	49 - 52¾
Am. Loco. com.	63½- 65¼	N. Y. Air Brake.	98 -106
Am. Ship com.	101 -110	Pressed Steel c.	62 - 68
Am. Steel Fdries.	75½- 83¼	Ry. Steel Spg. c.	73 - 76⅜
Baldwin Loco. c.	73¾- 80⅝	Ry. Steel Spg. pf.	105 -107
Bald. Loco. pf.	102 -102½	Republic com.	74¼- 77
Beth. Steel com.	61 - 61½	Republic pf.	101¾
Beth. Steel cl. B.	60½- 63¼	Sloss com.	50 - 50¾
Central Fdry. pf.	32 - 33½	Sloss pf.	88
Colo. Pneu. Tool.	63½- 64	Superior Steel	34 - 36⅜
Colo. Fuel	36⅞- 38⅝	Transue-Williams	38 - 39
Crucible Steel c.	57⅛- 60⅞	Un. Alloy Steel	39⅜- 42
Crucible Steel pf.	92¼	U. S. Pipe com.	15¾- 20½
Gen. Electric	152 -155¼	U. S. Pipe pf.	48¼- 54¾
Int. Nc. Ore Cert.	38⅝- 40¼	U. S. Steel com.	91⅝- 95⅛
Gulf States Steel.	53⅝- 56¼	U. S. Steel pf.	114 -114⅝
Int. Har. com.	114 -116	Westingh. Elec.	42¼- 44¼

Dividends

The Cambria Steel Co., quarterly, 75c. and extra 75c., payable March 15.

The Century Steel Co., quarterly, 35c., payable March 1.

The Crucible Steel Co., quarterly, 1¾ per cent on the preferred, payable March 31.

The National Enameling & Stamping Co., quarterly, 1½ per cent on the common, payable March 20, and 1¾ per cent on the preferred, payable March 31.

The New York Air Brake Co., quarterly, 2½ per cent, payable March 21.

The Republic Iron & Steel Co., quarterly, 1½ per cent on the common, payable May 1, and 1¾ per cent on the preferred, payable April 1.

Industrial Finances

Earnings of the American Car & Foundry Co., Detroit, for the current fiscal year ending April 30, 1919, are expected to surpass all records. Since last May gross business has totaled between $900,000 and $1,000,000 daily, making possible a 12 months' turnover of approximately $300,000,000.

The Niles-Bement-Pond Co., Plainfield, N. J., maker of machine tools, earned a total of $9,300,721 last year, of which net profits amounted to $3,181,933. These were equivalent, after the deduction of preferred dividends, to $36.33 per share earned on the $8,500,000 common stock, which compares with $3,133,633, or $35.76 per share of 1917.

It is probable that the stockholders of the American Steel Foundries will be asked to authorize a threefold increased capitalization at the annual meeting late in March. An issue of $25,000,000 preferred will probably be sought so that Steel Foundries may be able to acquire any available bargains in plants. A slash of $4,000,000 in inventories accounts for the reported balance for the stock of but $15.68 for the full year 1918, whereas for the nine months it had shown $15.16 a share. Until the Railway Administration, its sole customer, comes into the market, it will run on fractional capacity, other plants besides the two present idle ones possibly having to close.

American International Corporation offers approximately $225 a ton, a total of $42,000,000, the actual cost to the Government, for the first 25 vessels constructed at Hog Island. The ships are steel, oil-burning, turbine-driven freighters of 7500 deadweight cargo capacity with a speed of 11½ knots.

The Quadro Machine & Tool Co., 75 Summit Street, Newark, N. J., has filed a petition in bankruptcy.

The Metal Products Co., Goshen, Ind., has filed a certificate of dissolution of the company.

Judge Knox, United States district court, New York, has appointed Frank E. Davis receiver for the Weiss Engine Co., 17 Battery Place. The liabilities of the company are said to be $70,112 and assets, $60,747.

The Robinson Machine Co., Ecorse, Mich., has filed a voluntary petition in bankruptcy, with liabilities listed at $226,278 and assets at $197,047. Underestimated cost of the production of war products is held as the cause of the financial difficulty.

Net earnings for 1918 of the Underwood Typewriter Co., Inc., were $4,020,437 as compared to $3,162,226 in 1917, according to a report just issued. The surplus of the past year after expenses and war taxes amounted to $2,130,846, equivalent to 23 3/5 per cent earned on the $9,000,000 outstanding common stock after the deduction of preferred dividends, compared to 22⅜ per cent earned on the $8,600,000 stock the year before. Due to the removal of the restrictions surrounding the export trade by the War Trade Board, the company has been enabled to make shipments to every part of the world for the first time in a number of years.

H. H. Noble, president of the Noble Electric Steel Co., San Francisco, has sent a letter to stockholders in support of a proposition to create a first mortgage bonded indebtedness of $500,000. The letter states that while the company did a business during 1918 aggregating $1,476,940, the net profit, by reason of one untoward occurrence after another, was reduced to $1,522.97. Trouble about obtaining electrodes, and the fact that the company was hampered with a large quantity of pre-war contracts for ferromanganese at $160 and $170 a ton were the chief causes for the poor financial showing of the year.

The Union Trust Co., Pittsburgh, has purchased from the Aluminum Co. of America, of that city, $12,000,000 6 per cent serial notes. The company states that the sale of these notes is simply a refinancing proposition, and does not mean that it will build any new plants or make additions to existing works. These notes will likely be offered in the near future to the public by the Union Trust Co. and Guaranty Trust Co. of New York.

The Wellston Iron Furnace Co., Wellston, Ohio, has increased its capital stock from $1,200,000 to $1,400,000.

Annual Report of J. G. Brill Co.

The J. G. Brill Co., Philadelphia, maker of draw car attachments, reports the sales value of the combined output of the three plants wholly operated by the company as amounting to $16,761,154 for 1918, which is nearly double high-water marks made in 1907 and 1913. It is estimated that the net profit for the past year will be $916,509. The company, especially at its Philadelphia plant, was engaged chiefly in the manufacture of cars, trucks and field equipment for the Government. In spite of cancellation of war contracts work amounting to $8,204,448 appeared on the books Feb. 1. The Wason Co., a subsidiary, which produced airplanes for the Springfield Aircraft Corporation, is preparing to make cars.

Allis-Chalmers Mfg. Co. Prospers

During 11 months of 1918 the Allis-Chalmers Mfg. Co. made deliveries amounting to $5,000,000 in excess of the full year of 1917, the net profits for the same period being almost $1,000,000 in excess. Gross sales were $31,434,110 and net profits $4,996,892. On Nov. 30, 1918, current assets exceeded current liabilities by $23,921,208, which is considered remarkable, since most companies have been forced to borrow to maintain sufficient inventories. The only Government work was machining shells, the remainder of the business pertaining to milling, mining and all kinds of machinery.

Sweden's mineral output in 1917, from data recently made public, show the iron ore to have been 6,542,542 tons, including slick and briquetted ore. This compares with 7,322,983 tons in 1916. The manganese ore production in 1917 was 19,873 tons as compared with 8894 tons in 1916.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.80c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barbed wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 per cent off list for carload lots, 57 per cent for 1000-rod lots, and 56 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.20 base
Large boiler rivets.....$4.30
7/16 in. x 6 in. smaller and shorter rivets..
50-10 per cent off list
Machine bolts h.p. nuts, ¾ in. x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads .....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.:
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads .....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts .....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq., blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped....2.00c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger.....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts .....70-10 per cent off list
Stove bolts .....2½ per cent extra for bulk
Tire bolts .....50-10-5 per cent off list
The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, per 100 lb., $3.70, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.05 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $14.50 per package; 8-lb. coating, I. C., $14.80; 12-lb. coating, I. C., $16.50; 15-lb. coating, I. C., $17.50; 20-lb. coating, I. C., $18.75; 25-lb. coating, I. C., $20.00; 30-lb. coating, I. C., $21.00; 35-lb. coating, I. C., $22.00; 40-lb. coating, I. C., $23.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.70c. from mill. Refined iron bars, 3.00c.; common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	26	—
½	51	36½	⅜	27	Lost
¾ to 3	54	40½	½	31	12
			¾ to 1½	36	24

Lap Weld

2	47	34½	1¼	21	4
2½ to 6	50	37½	1½	28	14
7 to 12	47	33½	2	29	15
13 and 14	37½	..	2½ to 6	31	16
15	35	..	7 to 12	28	15

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	⅛, ¼ and ⅜	25	8
½	48	35½	½	30	17
¾ to 1½	52	39½	¾ to 1½	36	21
2 to 3	53	40½			

Lap Weld, extra strong, plain ends

2	45	33½	1¼	22	7
2½ to 4	48	36½	1½	28	14
4½ to 6	47	35½	2	30	17
7 to 8	43	29½	2½ to 4	32	20
9 to 12	38	24½	4½ to 6	31	19
			7 to 8	23	11
			9 to 12	18	6

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on galv. and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	37	3½ to 4½ in.	12½
2½ to 3¼ in.	27	3 to 3½ in.	+ 2
2¼ in.	20½	2½ to 2¾ in.	+ 4½
1¾ to 2 in.	16	2 to 2½ in.	+13½
		1¾ to 1⅞ in.	+22

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$334	1¾ in.	$214
1¼ in.	274	2 to 2½ in.	184
1⅜ in.	264	2¾ to 3¾ in.	174
1½ in.	214	4 in.	184
		4½ to 5 in.	214

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier	3.85
Nos. 9 and 10 (base)	3.90
Nos. 11 and 12	3.95
Nos. 13 and 14	4.00
Nos. 15 and 16	4.10
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.50
Nos. 22 and 24	4.55
Nos. 25 and 26	4.60
No. 27	4.65
No. 28 (base)	4.70
No. 29	4.80
No. 30	4.90
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.05
Nos. 12 and 14	5.15
Nos. 15 and 16	5.30
Nos. 17 to 21	5.45
Nos. 22 and 24	5.60
Nos. 25 and 26	5.75
No. 27	5.90
No. 28 (base)	6.05
No. 29	6.30
No. 30	6.55
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.50
Nos. 17 to 21	4.55
Nos. 22 to 24	4.60
Nos. 25 and 27	4.65
No. 28 (base)	4.70
No. 29	4.75
No. 30	4.75
Nos. 30½ and 31	4.80

Metal Markets

The Week's Prices

Cents per Pound for Early Delivery

Copper, New York			Lead		Spelter	
	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
Lake						
	16.75	72.50	5.00	4.70	6.70	6.35
	16.50	72.50	5.10	4.85	6.70	6.35
	16.00	72.50	5.10	4.85	6.65	6.30
	....	....	...	...	...	...
	15.75	72.50	5.10	4.85	6.65	6.30
	15.50	72.50	5.25	5.00	6.60	6.25

NEW YORK, Feb. 26.

Demand for all the metals continues light, but the dency is somewhat firmer. Copper has again de- ed almost daily. The tin market is stagnant and moralized. Lead, while quiet, is stronger. Spelter till inactive but fairly steady. Antimony is dull.

New York

Copper.—There seems to be no limit to the decline prices. On sales of small quantities the market fallen almost daily until yesterday electrolytic per for early delivery was sold at 15.50c. per lb., New k. This could be shaded by either large or small ducers under favorable conditions. Lake copper was inal at about 16.25c., New York. The market is irely one of supply and demand, with buying only a hand-to-mouth character. The fact that one large ducing company has borrowed $12,000,000 to carry stocks of copper, rather than sell at a loss now, lects the serious position of the market. There is er consideration a proposition that producers and sumers take over the Government stocks of copper some basis instead of their being held and later d by the Government.

Tin.—The market continues dull, stale and stag- nt, with Straits tin in 5-ton lots and over quoted at 50c. per lb., New York, the fixed price, and only ainable from the allocated metal in the hands of the ited States Steel Products Co. Smaller quantities, 5 s and less, are obtainable from other sources at er 72.50c., but the actual level is difficult to quote. fact, the only free market in tin is in small lots. erican electrolytic or pure tin is quoted at 69.12½c. small lots and about 68.25c. in the wholesale market, h 99 per cent domestic wholesale tin at under 67c. lb. Arrivals this month to Feb. 17 have been 1240 s, of which 1190 tons has come through Pacific ports. t Straits in London was quoted yesterday at £213 ton.

Lead.—A moderate business has been done in the t week at from 5c. to 5.20c. per lb., New York. The ding producer raised its quotation from 5c. to 5.10c. Feb. 20 and also to 5.25c., New York, yesterday, ch is the present level. The St. Louis quotation is 5c. The market is firm and it is believed that bot- was reached at about 5c. some weeks ago.

Spelter.—Stocks continue to pile up and demand is here near in proportion. The firmness which has racterized the situation for some days has given e to a softening tendency. Prime Western for early ivery is quoted at 6.25c., St. Louis, or 6.60c., New k, with demand light, though a fair business is re- ted by some. Present levels are below cost of pro- tion.

Antimony.—Wholesale lots for spot delivery are held 6.87½c. to 7c., New York, duty paid, with futures at to 7.12½c. Demand is light. Jobbing lots are ted at 7.37½c. to 7.50c., New York, duty paid.

Aluminum.—The outside market, so called because influenced by the maximum quotations effective until March 1, is quoted at 31c. to 32c. per lb. for No. 1 virgin metal as compared with the maximum price of 33c. per lb. in 50-ton lots.

Old Metals.—The market continues weak. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	16.75
Copper, heavy and wire	15.75
Copper, light and bottoms	13.75
Brass, heavy	12.00
Brass, light	9.50
Heavy machine composition	16.50
No. 1 yellow rod brass turnings	9.00
No. 1 red brass or composition turnings	14.00
Lead, heavy	4.50
Lead, tea	3.25
Zinc	5.25

St. Louis

FEB. 24.—The nonferrous markets showed a little more strength the past week, but not enough to accentuate the situation. Lead in carloads closed at 4.80 to 4.85c., and spelter at 6.40c. In less than carloads quotations were: Lead, 5.25c. to 5.50c.; spelter, 7.25c.; tin, 72.50c.; copper, 19c. to 20c.; Asiatic antimony, 8.50c. In the Joplin district there was little change, with second grade zinc blende bringing $40 to $42 per ton, while top grades sold for $45, basis 60 per cent metal, although premium settlement transactions brought even higher prices for extra quality. Lead ore started out weak, but strengthened somewhat later, bringing $50 per ton, basis 80 per cent metal. Calamine was quiet at $27.50, basis 40 per cent metal. The averages reported for the week were: Zinc blende, $41 per ton; calamine, $28, and lead, $51. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6.50c.; heavy yellow brass, 9c.; light copper, 12c.; heavy red brass, 14c.; heavy copper and copper wire, 14c.; pewter, 35c.; tinfoil, 40c.; lead, 4c.; zinc, 3c.; tea lead, 3c.; aluminum, 18c.

Chicago

FEB. 24.—In copper there has been considerable activity, the past week being considered the best of any in two months. Tin buying is confined to routine demand. The Government price of 72.50c. is quoted, but outside lots have been sold at less. Lead is stronger, following rather heavy buying. In antimony there has been fair activity, but spelter is dead. We quote copper at 18c. to 19c. for carloads; tin, 72.50c.; lead, 5c. to 5.10c.; spelter, 6.50c.; antimony, 8.50c. to 9c. On old metals we quote copper wire, crucible shapes, 13c.; copper clips, 12.50c.; copper bottoms, 11.25c.; red brass, 13.25c.; yellow brass, 8.50c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 30c.; tinfoil, 35c.; and block tin, 45c.

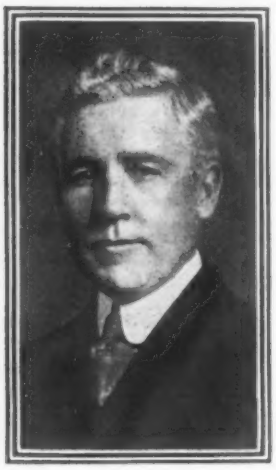
Tin Mining in the United States

In this country there are at present two companies prospecting tin deposits—one in Rockbridge county, Va., and the other in the Black Hills, South Dakota. The Virginia deposit, which was tied up in a legal tangle, was commandeered by the War Department and later turned over to a Boston company to develop. Work was started about Oct. 1, 1918, to clean out some of the old workings and was still under way at last report.

Near Hill City, South Dakota, the Cowboy mine, formerly owned by the Harney Park Co., was acquired by a St. Louis company about two years ago, and the work of unwatering the old shaft was begun. Financial difficulties caused the work to be suspended for a time, but it was recently reported again under way.

A large plant for making aluminum was under construction in Silesia, Germany, shortly before the armistice, according to *L'Usine*, Dec. 5, 1918. It was to have been the largest in Silesia and the Krupp group was heavily interested.

PERSONAL



GEORGE W. BURRELL

George W. Burrell, who was elected second vice-president of the Wellman-Seaver-Morgan Co. at the annual meeting of stockholders in Cleveland Feb. 18, has been in the continuous employ of that company for 21 years, having become affiliated in 1898 as a draftsman. He has occupied the following other positions: Inspector, chief inspector, assistant purchasing agent, assistant secretary, assistant works manager, manager of works. He will now have entire charge of the company's works, both at Cleveland and at Akron. He was born in 1871 and attended the Cleveland public schools, which he left at the age of 14 to learn the machinist's trade. He worked in machine shops for five years, during which time he studied nights in preparation for college. In 1891 he entered Ohio State University, where he took a three years' course in mechanical engineering.

The stockholders of the Wellman-Seaver-Morgan Co. re-elected the following board of directors: Edwin S. Church, F. E. Borton, W. H. Cowell, F. B. Richards, S. T. Wellman, E. H. Whitlock of Cleveland, S. H. Pitkin, Francis Seiberling and F. A. Seiberling of Akron. The directors elected the following officers: Edwin S. Church, president and general manager; S. H. Pitkin, vice-president; George W. Burrell, second vice-president; W. H. Cowell, secretary and treasurer.

At the fourth annual meeting of the Society of Ohio Safety Engineers, held in Cleveland recently, J. M. Woltz, safety director Youngstown Sheet & Tube Co., was re-elected chairman. A. C. Cook, claim agent, Carnegie Steel Co., at Youngstown, was re-elected vice-chairman. E. R. Rose, secretary central safety committee Republic Iron & Steel Co., Youngstown, was re-elected secretary and treasurer; and Wallace Dunn, claim agent Republic Rubber Co., Youngstown, was elected assistant secretary and treasurer.

John P. Danks, assistant purchasing agent Truscon Steel Co., Youngstown, Ohio, has resigned to become manager of the A. H. Seyler Co., automobile accessories' dealers.

Among the delegates to the National Foreign Trade convention at the Congress Hotel, Chicago, April 24 to 26, selected by the Milwaukee Association of Commerce are: Theodore O. Vilter, president Vilter Mfg. Co.; W. W. Coleman, president Bucyrus Co., South Milwaukee; L. L. Newton, general manager Parker Motor Truck Co.; H. C. Holthoff, Allis-Chalmers Mfg. Co.; Arthur Davidson, vice-president Harley-Davidson Motor Co.

L. T. Harper, formerly connected with the Byron Jackson Iron Works, San Francisco, who left about a year ago to establish connections for that company in India, has returned to San Francisco and opened an office in the Mills Building for the export of machinery under the name of the Shields-Harper Co. Mr. Harper says that American goods are meeting with a great success in India.

James M. Woltz, safety director Youngstown Sheet & Tube Co., Youngstown, Ohio, was elected chairman of the Society of Ohio Safety Engineers at the fourth annual meeting held recently in Cleveland. A. C. Cook of the Carnegie Steel Co. was chosen vice-chairman; E. R. Rose, Republic Iron & Steel Co., secretary and treasurer; and Wallace Dunn, Republic Rubber Co., assistant secretary and treasurer.

Louis Gloe, Two Rivers, Wis., for many years associated with plant No. 3 of the Aluminum Goods Mfg. Co., Manitowoc, Wis., has resigned and March 1 will become secretary of the Leyse Aluminum Co., Kewaunee, Wis., which recently changed its name from Aluminum Sign Co. and increased its capital stock from $75,000 to $200,000 to finance a general expansion scheme.

W. E. Perrine, assistant general manager and production director Standard Parts Co., Cleveland, will become associated with the General Motors Corporation on March 1 and will be in the executive and production department of the Chevrolet division with headquarters in New York.

A. G. Jablinski, formerly with the Browning Co., Cleveland, has become associated as chief engineer with the American Crane & Engineering Co., Nasby Building, Toledo, Ohio, which is bringing out a line of locomotive cranes.

W. J. Munro, formerly in the Production Division of the Ordnance Department in Washington, with the rank of captain, has become connected with the sales department of the General Motors Truck Co., Pontiac, Mich.

Charles Hopkins, for nine years superintendent of the extensive department of the Lebanon Valley Iron & Steel Co., Lebanon, Pa., has resigned to take up farming in New York State. Charles Donley, superintendent of the hot bolt department of the Lebanon, Pa., plant of the Bethlehem Steel Co., will succeed him. The changes are effective March 1.

George Boole will retire March 1 from the executive and active management of A. M. Castle & Co., Washington, of which he was the founder. On March 12, 1906, he bought the stock of steel, etc., carried in Seattle by Dunham, Carrigan & Hayden Co. of San Francisco and started the Western Hardware & Metal Co. Later he became associated with A. M. Castle & Co. of Chicago. A new corporation was formed, A. M. Castle & Co. of Washington, which took over the Western Hardware & Metal Co. and its personnel, July 1, 1918. Mr. Boole was made vice-president.

After six months of service as chief of Fuel Oil Section Bureau of Oil Conservation, United States Fuel Administration, Edward S. Davis has returned to Tate, Jones & Co., Inc., Pittsburgh, furnace engineers. He will serve as district manager, directing sales and service in the Chicago district, with offices at 931 Monadnock Building, Chicago.

Captain Henry Bryant of Henry Bryant & Co., Milwaukee, dealers in old material, has returned from France, after a year's service with the A. E. F., and is again actively engaged in the scrap business.

E. H. Welker, resident manager Detroit office of the Vanadium Alloys Steel Co., leaves that company Feb. 15 to become general manager of the Michigan Metal Supply Co., 501 Book Building, Detroit. The company will represent the following firms in Michigan: Ricker & Shafer Co., Erie, Pa., manufacturers of collapsible steel dies; Steel Furniture Co. of Grand Rapids, and stampings; Aetna Ball Bearing Co., Chicago, and Great Lakes Foundry Co., Port Huron.

Dudley R. Kennedy has opened an office as consulting and practical adviser in labor employment and industrial relations problems in the Real Estate Trust Building, Philadelphia. He has held the following positions in the past: Director of labor, B. F. Goodrich Co., Akron, Ohio; assistant to the president, Youngstown Sheet & Tube Co., Youngstown, Ohio; manager of industrial relations for the American International Shipbuilding Corporation, Hog Island, Pa.

Aborn Steel Co. has acquired the services of F. J. Schwarb, formerly with Beals & Co. and the Cyclone Mfg. Co. of Buffalo, who will be located at the Buffalo office, 520 Marine Bank Building. R. H. Smith, formerly of the Colonial Steel Co. and Brown-Wales Co., will have charge of the new office and warehouse at Boston in the capacity of district manager.

John W. Watson has severed his connections with the American Bronze Corporation, Berwyn, Pa. Active

anagement he turned over to M. C. Dittmann several onths ago when he became director of publicity for the hiladelphia district, and later assistant chief of the ispano-Suiza Engine Section of the Bureau of Air-aft Production. Recently he relinquished the presi-ncy of the American Bronze Corporation, which he d held since the foundation of the business in 1906. owever, he will retain his holdings and remain a mem-er of the board of directors. He will be connected ith a new company known as the John W. Watson o. He has been succeeded by George D. Porter, Phila-lphia, president; and by Matthew C. Dittmann, vice-resident, treasurer and general manager. Edwin G. nderson, advertising and sales manager, has been lected secretary; Charles H. Baker, formerly with the imken Roller Bearing Co., Canton, Ohio, has been amed assistant secretary and treasurer, and will be charge of production.

Malcolm R. Maclean, formerly manager in the Pitts-urgh district of the American Steel Foundries, after pending 18 months in the army, is now filling the posi-ion of sales manager of the Duquesne Steel Foundry o., Pittsburgh.

Eugene W. Pargny, president of the American Sheet Tin Plate Co., Pittsburgh, is at Palm Beach, Fla.

John R. McCune, president of the Union National ank, Pittsburgh, has been elected a director of the ressed Steel Car Co., to succeed Hay Walker, Jr.

John M. Jamison of the Jamison Coal & Coke Co., reensburg, Pa., is being mentioned as a possible can-idate on the Republican ticket for the vacancy in Con-ress from the Westmoreland-Butler district, caused by he death of Representative Edward E. Robbins.

R. G. Ames has joined the Black & Decker Mfg. Co., altimore, machinery manufacturer, in the capacity of ranch manager, in charge of the Chicago office. Mr. mes has been associated for the past 10 years with he Edward A. Cassidy Co., New York.

W. S. Quigley, president Quigley Furnace Special-ies Co., Inc., sailed for Liverpool on the Baltic Feb. 15 o develop European connections of his company. He ill spend several weeks in England, France and Italy nd visit plants installing the Quigley system for pre-aring and burning pulverized coal and lignite.

George H. Bigelow, assistant chief engineer Liberty Mutual Insurance Co., Boston, Mass., addressed the Hampden County (Mass.) Safety Council, Feb. 17, at Springfield, on "Accident Prevention Through Safety

At the organization meeting of directors of Air Re-duction Co., Inc., New York, Feb. 19, the following of-ficers were elected: A. S. Blagden, president; A. R. Ludlow, vice-president; C. E. Adams, treasurer; M. W. Randall, secretary; C. L. Snow, assistant treasurer; C. C. Emerson, assistant secretary.

B. T. Bacon of Pickands, Brown & Co., Chicago, will leave that city February 28 to spend two months on the Pacific coast, principally at Del Monte, Cal.

Richard T. Browne, Jr., has joined the sales force as salesman in the Pittsburgh office of the Youngstown Sheet & Tube Co., Youngstown, Ohio. Percy O. Eisen-beis has been transferred from the sales office at Youngstown to be salesman in the St. Louis district sales office at 1139 Olive Street and A. H. Bennell has been transferred from the Youngstown office to be salesman in the Cleveland office of the company.

Judge E. H. Gary has returned from a trip to Florida.

L. D. Fisher, president L. D. Fisher Co., 228 Mus-kego Avenue, Milwaukee, wholesale dealer in scrap metal and junk, sailed recently for Europe to establish a branch office and warehouse for handling war ma-terial scrap. Mr. Fisher plans to market the material in Europe and will open branch offices in Manchester, Eng., Paris and Bucharest.

The Chicago Pneumatic Tool Co. announces the re-moval of its Cleveland district office from room 813 to rooms 406-408 Engineers' Building, effective March 1. Ross Watson is district manager.

OBITUARY

M. THOMAS O'LEARY, president and treasurer L. W. Pond Machine & Foundry Co., Worcester, Mass., died at his home in that city Feb. 21, aged 42 years. He was a native of Millbury, Mass., and entered the office of the Pond company immediately after his graduation from high school. When Calvin Colvin, manager, retired, Mr. O'Leary was given increased responsibilities, until he became the general manager. The machinery end of the business was finally discontinued and the gray iron casting department given increased capacity, until the foundry became one of the most important in New England. Four years ago Mr. O'Leary purchased a controlling interest in the company and became the president and treasurer of the corporation. He continued as the active head of the business until a very short time before his death. Under his ownership the plant was largely increased in capacity. He was prominent in the banking and business life of his city, and was a member of the New England Foundrymen's Association and the American Foundrymen's Association.

JOSEPH SILLMAN, president and founder of the Michigan Smelting & Refining Co., Detroit, died of pneumonia Feb. 15 at his home in Detroit. During the last 20 years he was prominent in developing the manufacture, smelting and refining of non-ferrous metals. He developed a business second to none of its kind in this country. Mr. Sillman was born March 9, 1870, and went to Detroit 25 years ago. He established the Michigan Smelting & Refining Co. in 1900. He was appointed a member of the Government committee directing the equable distribution of non-ferrous materials and the reduction of waste of these materials during the war. He was also active in the Government work of controlling the distribution of tin during the serious shortage. At his death he was vice-president of the Peninsular Brass Works, secretary and treasurer of the Thiery & Kendrick Mfg. Co., and president of the Valley Smelting Co., Cleveland.

GEORGE EDWARD DRUMMOND, president Drummond, McCall & Co., Montreal, Can., iron merchants, died in London Feb. 17 when in England on a business trip. He was born at Tawley, Ireland, Oct. 21, 1858, and moved to Canada at an early age, soon after which he became a clerk in an iron and steel merchant's office in Montreal. He established in 1881 the firm of which he has since been president. Among the honorary positions which he held were those of president of the Canadian Manufacturers' Association, president of the Canadian Mining Institute, president of the Montreal Board of Trade, consul general of Denmark in Montreal, and one of the governors of McGill University. He was author of "The Iron Industry in Canada" and "Fiscal and Imperial Defense Questions."

WILLIAM MANSON MACKAY, for some years manufacturer of heating boilers and best known for his long-time identification with the American Society of Heating and Ventilating Engineers, died Feb. 19 of pneumonia, at Orange, N. J., aged 63 years. He was born in Montreal Nov. 24, 1855, and came to New York in the early 80's. He was a charter member of the American Society of Heating and Ventilating Engineers and was president in 1897, and was secretary for a long period of years. He was a prolific inventor, chiefly of heating apparatus and devices.

FRANK E. STACY, president E. S. Stacy Machine Co., Springfield, Mass., died on Feb. 17 of pneumonia. For 16 years he served in the city government and had completed only six weeks ago his four years as mayor. Born in 1871, he was an engineer, a musician of note, served as president of the New England Hardware Dealers' Association for three years, and was a director of the National Hardware Dealers' Association.

WILLIAM J. TURNER, president Turner Mfg. Co., Pt. Washington, Wis., manufacturer of gas engines, tractors and machinery, died at his home in Milwaukee Feb. 15, at the age of 71 years. His son, Lee M. Turner, is vice-president and general manager of the company.

IRON ORE TAXATION

Interesting Fight Pending in the Minnesota Legislature with Result in Doubt

The Minnesota Legislature is making its biennial effort to add to the taxes of the mining companies of the State. Two bills are now before the House and the final hearing of these bills was held on Monday afternoon, Feb. 24, at which the opposition was heard at length. One of these bills is in line with those which have preceded it at many sessions of the Legislature, and calls for a supertax of 2 per cent on the gross value of all ore mines in the State, this tax to be paid into the State general fund and not to be distributed as are other taxes. The other bill is fathered by the Non-Partisan League, which has some 30 members in the Minnesota House, and it calls for a supertax of 10 per cent on the net value of all ore mines, net being the Lake Erie value of the ore less cost of mining and transportation, less royalties and less overhead charges. It is estimated by the proponents of this latter bill that it would return to the treasury of the State something like $6,500,000 per year, while the 2 per cent gross bill would return but $2,500,000. They claim to have made this estimate as results of computations secured from the office of the Minnesota State Tax Commission.

Taxes in Minnesota are governed by the tax commission, and are based on varying variations running from 33⅓ per cent of the value on suburban property and 40 per cent on urban property, to 50 per cent on mining property, the higher rate on mines having been made by the Legislature because of the belief that the mines are a vanishing heritage and that ore once taken out of the ground and removed can never again be taxed. The total collection of taxes in Minnesota, local, county and State, amounted in 1917 to about $60,000,000, of which the mines paid about $10,000,000. In 1918 they are somewhat higher and the mines' share will be considerably more, or not far from $14,000,000. This is without the passage of either of these supertax bills. The arguments made in favor of these bills is that the State has some sort of heritage in the products of the soil, such as ores; that they are the property in a certain way of the commonwealth; and that they are vanishing, therefore still higher and additional taxes should be levied. The arguments against them briefly are that the mines are now paying on a higher valuation than other property because of this "vanishing" argument; that they are the only property in the State which is actually paying on the basis of its real and true valuation, the tax commission having been able to locate all iron ore in the State and to figure its actual worth without difficulty; and that any additional taxes will not only injure all producers, particularly the smaller ones, and those operating underground where labor is a chief factor of cost, but also will tend to develop and strengthen competitive regions.

In the past the mining branch of the United States Steel Corporation has led in the various fights before the Legislature against the imposition of these supertaxes. This year, however, the corporation is conspicuous by its absence, and the struggle is apparently being carried on by the small and independent companies whose sufferings under such a bill are plainly evident. The campaign against this bill has been quiet and many have felt that no efforts to defeat it were in progress.

It is impossible at this time to give any prognostication as to the probability of the passage of either of these bills. In the past there have been combinations in the Legislature, liquor and anti-liquor, and of other sorts, that have made it rather easy to predict whether tonnage tax bills would pass. This time, however, there is no such possibility of combination, and it will be some time before any one can tell whether these unfair bills will succeed. The only combination in the Legislature at this time is that of the Non-Partisan League membership, a new factor and which controls this year something less than 25 per cent of the House. This block of votes will be solidly in favor of the 10 per cent net value bill.

The fight against these bills this winter is in the hands of such men as Frank J. Webb of the Republic Iron & Steel Co.; E. J. Maney of the Shenango Furnace Co.; Clement K. Quinn, an independent operator at Duluth; Dwight E. Woodbridge, a mining engineer at Duluth; A. B. Coates of the operating firm of Coates & Tweed; Wilbur Van Evera, a Cuyuna range operator, and Earl E. Hunner of M. A. Hanna & Co., and is being carried on by them, as assisting those legislative members who hail from St. Louis County.

The Luxemburg Iron Industry

Reports received by THE IRON AGE from Luxemburg indicate that conditions of the iron industry in that country are chaotic, and that unemployment is general. The transportation problem is a very serious one and is causing paralysis of industry of the entire Luxemburg-Lorraine district. The remedy is not in sight, and all local efforts have proved futile. A very decided tendency to separate from the German affiliations is being displayed. Several Luxemburg companies, members of the German Steel Works Association, have just announced their resignation, on account of the breaking of relations of the Grand Duchy and Germany.

The ore market is reported very dull, and no ore is being mined. No transportation is possible. The average price of Minette varies from 4 francs to 4½ francs per ton (80 to 90c.), an increase of about 10 to 15 per cent over prewar prices, a very small increase in view of the high cost of material and labor. This may be due to some extent to the competition of the Briey mines. Blast furnace plants are kept in operation in order to supply gas and electricity to towns and water works. In Differdingen, two out of 10 are in blast at a reduced rate.

Export policy is made clear by the fact that in Düsseldorf late in January the General Assembly of the German Steel Syndicate decided that in considering the competition of the French blast furnaces in the Swiss market the export prices of German pig iron to that country would be reduced $20 per ton, making the prices f.o.b. works as follows: Hematite, $100; Luxemburg No. 3, $80.

Exports from the United Kingdom Permitted

Consul General Skinner at London has cabled the Bureau of Foreign and Domestic Commerce, Washington, that the following goods, among others, may be exported from the United Kingdom: Adding and calculating machines; athletic goods; bicycles, but not tires; bicycle accessories; cash registers; clocks, including clocks for time checking; cutlery, all forms; drums; dental burs; dental filling materials; duplicating machinery and supplies therefor; electroplated goods, except silver or gold; ferric compounds; hardware (builders') if of iron or steel; household furnishings, fixtures and equipment if manufactured of wood, iron or steel, except upholstered furniture; laundry machinery; lighting fixtures, if of iron or steel; printing presses; razors, safety; sanitary ware; scales and balances; screw spanners; sewing machines; typesetting and typecasting machinery; typewriters.

Consul Lucien Memminger at Madras, India, has sent a report of prime importance to the American agricultural implement industry. He has notified the Department of Commerce that in acknowledging receipt from an American firm of catalog of agricultural implements, the Director of Agriculture of Hyderabad State, India, wrote:

"Unless we can have an agency in India to deal with, we cannot place orders in America, since it is a government rule that we must certify to the receipt of article in good order before payment can be made by the accountant general.

"Hitherto I have had catalogs without prices, which to me were worse than useless; but even when prices are stated, no business can result unless, as I explained above, there is an Indian agency."

SHORT TRADE ITEMS

The old plant of the Billings & Spencer Co. on Broad and Lawrence streets, Hartford, Conn., has been purchased by the Hartford Automotive Parts Co., which recently bought the Hartford Automobile Parts Co. and the Kinsler-Bennett Co., and they expect to move into the new quarters in about six months. The new plant has six buildings with some 120,000 sq. ft. of floor space. Plans for the present plant on Morgan street are not perfected, but it is possible that these quarters will be continued in addition to those afforded by the new facilities. George B. Kinsler, former manager of the Kinsler-Bennett Co., continues in an advisory capacity with the Hartford Automotive Parts Co., whose officers are: James M. Carney, chairman; Marvis McA. Johnson, president; H. W. Bigelow, secretary and treasurer; Theo. C. Hudson, assistant secretary and associate treasurer; George McCoomb, superintendent.

The business of the Cole Mfg. Co., Chicago, manufacturer of hot blast and air tight heaters, ranges and furnaces, has been changed from a syndicate to a corporation, organized under the laws of Illinois. The owners of the syndicate have sold out their interests to the new corporation which continues the business with a surplus above a $1,000,000 capitalization and without any liabilities. The officers are: H. A. Cole, president and treasurer; E. P. Cole, vice-president and assistant treasurer; C. W. Brelsford, secretary, and P. P. Stone, assistant secretary.

The Inland Steel Co., Chicago and Indiana Harbor, has purchased acreage with a mile frontage on Lake Michigan adjoining the Dunes Park. Of the 640 acres, 3 are above water. The company will use the site as a dumping ground for waste material, thereby making land which may be useful some time in the future. The area bought is several miles from Indiana Harbor.

The Walter-Wallingford Coal Co., Cincinnati, has been incorporated, with $100,000 capital stock, by L. F. Walter, B. A. Wallingford, Samuel H. Whitaker, C. S. B. Ward and A. J McCarthy The coal company will be an auxiliary to the Walter-Wallingford Co, pig iron, alloys and coke merchant. Offices are in the Traction Building.

The Sheffield Car Co., manufacturer of railway motor cars, marine engines, etc., Three Rivers, Mich., has consolidated with Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago. The company should be addressed Fairbanks, Morse & Co., Sheffield Plant, Three Rivers, Mich. No changes in the factory organization or management are contemplated at this time.

The Mahoning Foundry Co., manufacturing heating furnaces, will shortly take possession of the first unit of a new plant erected in Youngstown, Ohio. The buildings are of steel fireproof construction, and most modern. One practically completed is 100 x 200 ft., two stories. The other, also a two-story structure, is 140 x 200 ft. The company will continue to operate its present plant on Poland Avenue in Youngstown.

The Vanadium-Alloys Steel Co., Pittsburgh, has leased offices and warerooms at 566-568 West Randolph Street, Chicago. In its new warerooms, the company will carry a large stock of high-speed and alloy tool steels, and be in better position to serve its Chicago trade.

The Rome Metal Products Co. has removed its offices to 150 Nassau Street from its former location at 87 Nassau Street, New York.

The Duplex Machinery Co., Cleveland, has removed to its new offices and warerooms at 1224 West Sixth Street.

The Beckwith Machinery Co., Arch Street and Parkway, Northside, Pittsburgh, has opened an office and warehouse at 1227 West Ninth Street, Cleveland, in charge of E. D. Stoner, assisted by C. S. Dally. It will handle the regular lines of mine, mill and construction equipment marketed by the company.

The American Bosch Magneto Co. has taken over the real estate of the plant of the Bosch Magneto Co., Brightwood, Mass., for a consideration of $850,000 in connection with the sale by the Custodian of Alien Property. The officers of the new company are Martin E. Kern, president; Leon W. Rosenthal, vice-president; George A. MacDonald, treasurer; H. D. Altree, assistant treasurer.

The professional and special section of the United States Employment Service, formerly located at 29 South LaSalle Street, has removed to new and more extensive quarters at 63 East Adams Street, Chicago. This section, formerly known as the division of engineering, plans to enlarge its service to include all kinds of professional and technical men and women.

The Wellman-Seaver-Morgan Co., Cleveland, has opened a San Francisco office at 415-417 Rialto Building, in charge of Norman S. Ross. Business originating from California, Nevada west of the 115th meridian, lower California and the counties of Josephine, Jackson and Klamath in Oregon will receive the attention of Mr. Ross.

The Export Trading Corporation, New York, has been incorporated with a capital of $25,000 to deal in steel and iron products. E. V. Henschel, J. C. Eurengy and A. Frahme, 139 Lafayette Street, Brooklyn, are the incorporators.

The Alexander Milburn Co., Baltimore, has opened a branch office at 998 Monadnock Building, San Francisco, under the management of E. F. Walter. A stock of Milburn portable lights and oxy-acetylene apparatus will be kept on hand.

The Eastern branch of the Independent Pneumatic Tool Co. in New York will be moved from 170 Broadway into larger quarters at 1463 Broadway at Forty-second Street on March 1.

The Sterling Wheelbarrow Co., Milwaukee, announces the opening of a Boston office to handle its foundry line throughout the New England states. R. F. Jordon will have charge.

The Canton Steel Foundry Co., Canton, Ohio, has opened a New York office at 120 Broadway, and is also establishing an office in the People's Gas Building, Chicago. E. E. Silk will be manager of the latter office.

The DeForest Sheet & Tinplate Co. has purchased 75 acres adjacent to its plant on the Warren, Niles road, Trumbull County, Ohio, to be used for mill extensions. The additional acreage is railroad frontage.

The Edison Storage Battery Co. has moved its New York sales office from 209 West Seventy-sixth Street to 247 West Thirty-fifth Street.

Benjamin S. Foss, son of former Governor E. N. Foss, representing the B. F. Sturtevant Co., Hyde Park, Mass., and Boston, purchased the real estate of the Ames plow works and foundries with much of the equipment at Framingham, Mass., and will plan for the employment of some 500 workmen on making iron, brass and aluminum castings and on galvanizing.

At the annual meeting of the Wolverine Brass Works, Grand Rapids, Mich. the following officers were elected: President, L. A. Cornelius; vice-president, George G. Whitworth; secretary-treasurer, H. C. Cornelius. Directors, the officers, Henry B. Herpolsheimer and Lawrence Cornelius.

Machinery Markets and News of the Works

LARGE TOOL PURCHASES

Automobile Manufacturers Are Buying Extensively

Center of Activity Is Detroit and Cleveland—Second-Hand Equipment Coming Into Markets

A great deal of present activity in the machine-tool field is centered in Detroit and Cleveland, where manufacturers of automobiles and accessories continue to call for new equipment. Detroit reports that purchases of the Ford Motor Co. have totalled about $1,000,000, while other Detroit automobile manufacturers have bought about $1,500,000 worth more. Milling machines, grinders, shapers and planers are in greatest demand. Deliveries of most machines are being offered in four to six weeks.

The plans of the General Motors Corporation have created considerable interest, as enlargement of existing facilities is being contemplated in nearly every direction. These plans include, according to report, the enlargement of the Reo plant at Lansing, Mich., the purchase of another Lansing plant, the erection of a new factory for the Cadillac Motor Co., Detroit, and further additions in Pontiac, Bay City, Saginaw and Flint, Mich.

Orders have been placed in Cleveland during the past week by General Motors for the Toledo-Chevrolet plant and other orders are expected this week for Detroit and Janesville, Wis., plants. The Cleveland Automobile Co., which will build a new plant in Cleveland, will require considerable equipment.

Demand for boring mills from rubber tire manufacturers has been a feature of the inquiry received by the Cincinnati trade. Foreign inquiries received at Cincinnati include several from France, Belgium and Italy.

In the Chicago market, demand for tools is quieter, many prospective purchasers avowedly holding off in the expectation of lower prices, which many builde and dealers say cannot materialize within the near ture because of high production costs.

The New York market is also quiet, only one portant inquiry having come before the trade in past week, that being from the Liberty Steel Produc Co., New York, covering fabricating machinery for shipyard in Japan. More than 30 machines are includ in the list published in this issue. The French Hi Commission, New York, has inquired for about tools, said to be for reconstruction work in Belgiu Some fair-sized orders have been placed by the Na Department for a new torpedo station to be built Alexandria, Va.

The New Departure Mfg. Co., Bristol, Conn., w build an addition to its plant for the manufacture ball bearings. Three Shaw electric cranes have be bought and machine tool equipment will probably required.

A Baltimore report is that the Bartlett Haywa Co. and the Furst Realty Co., both of that city, ha concluded arrangements for the construction of a lar ship repair plant. The entire project is estimated cost $4,000,000.

Offerings of second-hand tools are now becomi more frequent, appraisals of war plants having be completed in a number of instances. The Governme is attempting to dispose of the entire equipment pu chased for the Cribben & Sexton Co. shell plant Chicago. The Mid-West Engine Co., Indianapolis, ha sold about 200 tools, which were used in the manufa ture of marine engines for the Navy. A New Yor machinery concern has taken over about 200 machin from the Symington Machine Corporation, Rochest N. Y., and these will be offered for sale. The equipme of the $1,000,000 plant of the Dayton Metal Produc Co., Dayton, Ohio, is being offered for sale by a Cle land machinery house. The Government will soon a tempt to dispose of about $20,000,000 worth of new a second-hand equipment located in northern Ohio, wes ern Pennsylvania and northern New York plants.

New York

NEW YORK, Feb. 25.

The New York machine-tool market is quiet. There are many inquiries, but sales thus far in February are not up to those of January. The large list of the Standard Oil Co. of New Jersey, N. W. Porter purchasing agent, is still pending, as is also the list of the New Process Gear Corporation, Syracuse, N. Y., for about 50 tools. The Liberty Steel Products Co., Woolworth Building, New York, has issued the following list of equipment on which quotations are desired, the machines being for export to a Japanese shipyard:

Two plate straightening rolls, 98 in. between housings and to handle 1-in. plates up to 96-in. wide. Hilles & Jones No. 4 or equal.

For Plate Shop

Three vertical single-end punches, 36 in. throat, capacity 1 1/16 in. holes in 7/8 in. plate.

Four vertical single-end punches, 48 in. throat, capacity 15/16 in. holes in 5/6 in. plates.

Six punch tables, built in sections.

Four roll tables, built in sections.

Two single-end, vertical shears, 36 in. throat, with convertible attachments for punching, capacity 1 in. plates; direct drive.

Two single-end, vertical shears 42 in. throat, with co vertible attachments for punching; capacity 5/8 in. plate direct drive.

Two plate bending rolls; capacity 1 in. thick x 30 ft. lon Similar to Hilles and Jones No. 8 Pyramid type (of bendi and flanging); 30 in. dia. top rolls and two 20 in. dia. botto rolls; one bottom roll slotted 5/8 in. opening 6 in. deep an 208 in. long; 85 hp. for bottom roll, 45 hp. for lifting an lowering top roll; gear drive.

For Angle Shop

Two horizontal punches, 12 in. throat, capacity 1 in hol through 1 in. steel; direct drive.

Two vertical punches, 18 in. throat, architectural jaws and high die block; capacity 1 in. hole.

Two angle shears; capacity 8 x 8 x 1 in. angle; direct drive.

Two horizontal bending and straightening machines, Hille & Jones No. 4 type or equal; gear drive.

Two angle shears, turn table base, capacity 6 x 6 x 5/8 in. angles; direct drive.

For Sheet Metal Shop

Two gate shears, guillotine type, 50 in. between housings, capacity 5/8 in. plates; type, Hilles & Jones No. 2 or equal.

Though buying by automobile companies has been quite

tive in the Central West, very little automobile buying has developed in the East.

Brewster & Co., Long Island, who have made a number of inquiries for tools for automobile work, have done no buying yet.

An interesting inquiry comes from the French High Commission, New York, covering about 20 machines or more. Information given out at the office of the commission was meager, it being stated that the machines were wanted for construction in Belgium. Newspaper reports have been current in the past week that the French Government would buy machine tools in this country within the next few months aggregating about $40,000,000, but the machine-tool trade has as yet no sign that these reports may prove true. On the other hand, most sellers have a well-settled conviction that France will not buy heavily of tools and allied equipment in this country.

The Navy Department continues to buy, some fairly large purchases having been made for the new torpedo station to be built at Alexandria, Va. The Trego Motor Corporation, New Haven, Conn., is in the market for a few tools.

Second-hand tools from war plants are making their appearance in the market. A New York machinery house has taken over the equipment of the Symington Machine Corporation, Rochester, N. Y., which was engaged in shell work. A part of the equipment will be sold as scrap, but about 200 tools in fairly good condition will be sold for second-hand use. The equipment in the shops of the Bartlett Hayward Co., Baltimore, has been appraised, and some of it will probably be soon offered for sale.

The Bartlett Hayward Co. has taken no action toward buying machinery for its proposed ship repair plant. A list of these machines was published in the Feb. 13 issue of THE IRON AGE.

The Locomotive Superheater Co., 30 Church Street, New York, which was taken over by the Alien Property Custodian because a controlling interest was in the hands of Germans, has been placed at the disposal of the Railroad Administration, which will operate the company's plant.

A few small crane inquiries are before the crane builders, but little buying is being done. The Bay State Street Railway, Boston, is inquiring for two 12-ton overhead cranes. The Bethlehem Mines Corporation, Bethlehem, Pa., wants a 10-ton machine shop crane. Specifications for about 20 large cranes wanted for the new United States Naval Ordnance plant at Charleston, W. Va., which will make armor plate, will soon be issued by the Navy Department.

The Milliken Brothers Mfg. Co., Woolworth Building, New York, has taken out a permit to make alterations and extensions in the building at 136th Street and the East River, to be used for its new steel fabricating plant. The work is estimated to cost about $27,000.

The Mason Richardson Corporation, Brooklyn, has been incorporated with a capital of $25,000 by C. J. Maxson, R. W. and F. J. Richardson, 420 Eastern Parkway, to manufacture automobile parts and machinery.

The Petroleum Engine & Mfg. Co., New York, has been incorporated with a capital of $100,000 by L. A. Michaelsen, W. P. Drew and D. Dessau, 116 Broad Street, to manufacture engines and kindred products.

The Gorman Auto Equipment Co., New York, has been incorporated with a capital of $10,000 by J. P. Gorman, C. H. Davis and F. C. Hunter, 80 Maiden Lane, to manufacture automobile equipment.

The Delta Foundry & Machine Corporation, New York, has been incorporated with a capital of $250,000 by F. J. McCall, F. C. Reilly and J. F. Shea, 116 Fifty-seventh Street, Brooklyn, to manufacture machinery, castings, etc.

The Horseshoe Tire Co., New York, has been incorporated with a capital of $100,000 by F. K. Espenhain, T. H. Spence and C. P. Skinner, 144 West Sixty-fifth Street to manufacture automobile tires.

Fire, Feb. 18, on the third floor of the plant of the brass and iron foundry of the Russell Foundry & Machine Works, 37-73 Sixth Street, Long Island City, N. Y., caused a loss in the pattern department and other parts of the works estimated at about $30,000. Frederick Russell heads the company.

The Alloy Metal Wire Co., Inc., New York, has been incorporated with a capital of $30,000 by E. H. Cleary, S. A. Murray and J. A. Marcato, Yonkers, to manufacture wire products.

The Chemical Machinery Corporation, New York, has been organized by C. Field, R. Smith, and J. J. Serrell, 90 West Street, to manufacture chemical machinery and equipment.

The Delivery Auto Truck & Body Co., 106 East 110th Street, New York, manufacturer of automobile truck bodies, etc., has filed notice of change of name to the Standard Commercial Body Corporation.

The Consolidated Dental Mfg. Co., 130 Washington Place, New York, will make alterations and improvements in its four-story factory on Tillary Street, near Gold Street, Brooklyn, to cost about $12,000.

The Invincible Hook & Eye Corporation, New York, has been incorporated with a capital of $20,000 by H. and J. Kapell and D. Marinsky, 32 Whitlock Avenue, Bronx, to manufacture metal specialties.

The Electric Oil Burner Co., New York, has been incorporated with a capital of $10,000 by N. Martin, N. Messenger and M. Muller, 429 East 156th Street, to manufacture oil burner equipment.

The Bliss Reproducer, Inc., New York, has been incorporated with a capital of $50,000 by D. N. Bliss, B. Seaboldt and J. D. Evans, 65 Broadway, to manufacture talking machines.

The Gasoline Engine Equipment Co., 347 Madison Avenue, New York, manufacturer of gasoline engine apparatus, has increased its capital from $15,000 to $50,000.

The Calorex Corporation, New York, has been incorporated with a capital of $250,000 by J. T. MacGregor, J. Monks, and A. H. Schneer, 949 Broadway, to manufacture electric heating and measuring devices.

The Harder Furnace & Engineering Corporation, New York, has been incorporated with a capital of $300,000 by M. E. Clark, 276 Winthrop Street, Brooklyn, and W. L. Harder and M. C. Monroe, 165 Broadway, New York, to manufacture boilers, furnaces and allied products.

Subject to the approval of the United States Government, the Foundation Co., 233 Broadway, New York, is said to have secured contracts from the French Government for the construction of 174 steel cargo vessels to cost in excess of $150,000,000. The ships will be constructed at the Tacoma, Wash., and Vancouver, B. C., plants of the company.

The Air Reduction Co., 120 Broadway, New York, has increased its capital to an active capitalization of $4,400,000.

The General Player Action Co., New York, has been incorporated with a capital of $300,000 by A. A. Fraser, B. and W. B. Ellision, 251 West 104th Street, to manufacture piano-player actions.

The Cole-Duncan Boiler Works, 15 Clay Street, Brooklyn, manufacturer of boilers, plate work, etc., has acquired property on Borden Avenue and Clay Street, in the vicinity of its present plant, and plans for the removal of its works to the new location.

The Liberty Alarm & Accessories Co., Inc., Great Neck, L. I., has been incorporated with a capital of $50,000 by F. A. Howe, Hempstead; W. H. Turner, Rockville Center, and H. Rohwer, 161 West Ninety-fifth Street, New York, to manufacture electrical products.

The Chal-Max Motor Distributing Co., New York, has been incorporated with a capital of $30,000 by E. L. and H. Sanger, and H. Weiss, 243 West Fifty-seventh Street, to manufacture motors and airplane parts, etc.

Arthur L. Kelley and Wesley M. Oler, Jr., connected with the Knickerbocker Ice Co., 1480 Broadway, New York, are organizing a company to build an ice-manufacturing plant on Railroad Avenue, Bay Shore, L. I. The initial works will include a main manufacturing plant, engine house, boiler plant and other structures, with estimated cost of about $100,000. Mortenson & Co., 347 Columbus Avenue, are architects.

The Schou Non-Metallic Piston Co., New York, has been incorporated with a capital of $500,000 by H. D. Fricke, J. Behrmann and C. Ericson, 103 East Ninetieth Street, to manufacture automobile engine pistons and similar specialties.

The Schaeffer Medical Appliance Mfg. Co., New York, has been incorporated with a capital of $20,000 by W. H. Schaeffer, J. L. Waters and M. Wyner, 1970 Mapes Avenue, to manufacture medical instruments and equipment.

The Deschanel Engineering Corporation, New York, has been incorporated with a capital of $50,000 by E. Lambert, F. Schnabel and J. Fast, 90 West Street, to manufacture metal goods.

The United States Railroad Administration has assumed control of the Locomotive Superheater Co., 30 Church Street, New York, through the purchase of a majority of the stock from A. Mitchell Palmer, Alien Property Custodian. It is understood that no change will be made in connection with the manufacture of superheaters as heretofore. George L. Bourne is president.

The Metallic Products Corporation, Asbury Park, N. J., has been incorporated with a capital of $50,000 by Elmer H. Brown, George L. Sexton and I. A. Snyder, to manufacture hardware, metal goods, etc.

The Howe Rubber Co., Codwise Avenue, New Brunswick, N. J., manufacturer of inner tubes for automobile tires and other rubber products, has awarded a contract to the Turner Construction Co., 242 Madison Avenue, New York, for the construction of a two-story addition, 76 x 105 ft.

Louis Sacks, Inc., Wilson Avenue, Newark, N. J., is operating its iron foundry at Boonton, N. J., at full capacity and is planning to increase the present output. To provide for the proposed increase application has been made to the New Jersey Power & Light Co. for additional electric power supply.

The Delaware Tin Corporation, Arlington, N. J., a Delaware corporation, has recently filed notice of change of name to the Seaboard Metal Corporation, New York.

The Kretschmer-Berger Co., New Brunswick, N. J., has been incorporated with a capital of $50,000 by W. A. and V. P. Kretschmer, Metuchen, and R. C. Berger, East Orange, to manufacture electric and steam equipment, including motors, engines, etc.

The Aluminum Co. of America, Pittsburgh, Pa., is planning for the erection of a three-story addition to its works at Edgewater, N. J., 125 x 300 ft.

The Pleasantville Motor Co., Pleasantville, N. J., has been incorporated with a capital of $125,000 by Edwin H. and Frederick G. Burk and John T. McKale, Atlantic City, to manufacture automobile parts, etc.

The W. & A. Fletcher Co., Hoboken, N. J., operating a shipbuilding and repair works on Hudson Street, is said to be planning for the erection of a new steel plate shop at its plant, 50 x 150 ft. A new floating drydock is also contemplated. The entire work is estimated to cost over $1,000,000.

H. T. Bailey & Co., 808 Broadway, Bayonne, N. J., have filed notice of organization to operate a steel heat-treating works. H. T. Bailey and Harold S. Carlson, 21 Linden Street, head the organization.

A new plant will be erected by the American Oil & Supply Co., 52 Lafayette Street, Newark, N. J., on Wilson Avenue, at a cost of about $100,000. The company is planning to dispose of its present plant and remove its entire works to the new location. Electric motors, pumping equipment, boiler apparatus and other equipment will be required. W. F. Hofmann is treasurer.

The Western Tool Co., 577 North Third Street, Newark, manufacturer of tools, etc., has increased its capital from $125,000 to $500,000.

The Upson-Walton Co., 462 Riverside Avenue, Newark, manufacturer of wire rope, has filed plans for the erection of a one-story galvanizing shop, 35 x 67 ft.

The Board of Freeholders, Jersey City, N. J., has had plans prepared for the erection of a new one-story power plant, 95 x 110 ft., at Laurel Hill, for county lighting and power.

The Ulster Knife Works, Ellenville, N. Y., is preparing plans for a two-story addition to its works, 52 x 52 ft., of steel, brick and concrete.

Buffalo

BUFFALO, Feb. 24.

Bradstro Appliance, Inc., Buffalo, N. Y., has been incorporated with a capital stock of $50,000 to manufacture automobile accessories, metal castings, etc. The incorporators are H. E. Bradford, Buckingham Hotel, Buffalo; J. H. Weir, 939 Lafayette Avenue, and G. W. Farrar, 232 Voorhees Avenue.

The Emco Mfg. Co., Binghamton, N. Y., formerly the Empire Mfg. Co., has moved into its new factory. It is in the market for a 22-in. drill press, back geared, automatic cut off, and some other small equipment. The company manufactures automobile specialties.

J. H. Williams & Co., 400 Vulcan Street, Buffalo, manufacturers of drop forgings, are taking bids for a one-story addition, 80 x 400 ft.

The Atlantic Stamping Co., Rochester, N. Y., is having plans drawn for an addition to its plant on Ames Street which it contemplates erecting in the spring.

The Great Lakes Pressed Steel Corporation, Buffalo, has been incorporated with a capital of $25,000 by J. S. Madill, M. G. Kazus and M. E. Robinson, to manufacture iron and steel specialties.

The Ross Novelty Mfg. Co., Buffalo, has been incorporated with a capital of $10,000 by P. Stahlka, A. Ross and G. R. Guster, to manufacture metal specialties.

The Hydrex Engineering Corporation, Buffalo, has been incorporated with a capital of $100,000 by G. F. Bredmeier, A. W. Dohman and R. Hanau, to manufacture gas and water meters and other measuring equipment.

The Yawman & Erbe Mfg. Co., 424 St. Paul Street, Rochester, N. Y., manufacturer of metal and wood office filing equipment, safes, lockers, etc., is planning for the erection of an addition to its plant.

The Merit Casket Co., Rochester, N. Y., has been incorporated with a capital of $150,000 by E. J. McGrath, A. J. Lauer and J. P. Burke.

Effective about May 1, the Government is planning to take the disposition of the plant of the Crown Optical Co., Rochester, N. Y., recently operated for the production of materials for the Ordnance Department. Negotiations are under way for the return of the property to the Crown company.

In connection with improvements and extensions in its building on South State Street, now under way, the Syracuse Buick Sales Co., Syracuse, N. Y., will establish a machine and repair shop on the third floor. A. C. Ross is one of the heads of the company.

The Standard Lock Co., Inc., Syracuse, N. Y., has been incorporated with a capital of $50,000 by J. P. Yohr, J. Lenon and E. L. Wilcox, to manufacture locks and kindred products.

The Onondaga Bed Mfg. Co., 718 East Water Street, Syracuse, N. Y., has acquired a five-story building on North State Street, and plans for the removal of its present metal bed manufacturing plant to the new location. It is proposed to increase the output at the new works.

The Meachem Gear Corporation, Syracuse, N. Y., has been incorporated with a capital of $300,000 to manufacture gears, pinions, etc. The company, headed by Thomas W. Meachem, formerly president of the New Process Gear Corporation, Syracuse, now operated by John N. Willys, Toledo, Ohio, will establish a plant on Canal Street for the new works. The production will be in conjunction with the New Process company, taking over certain features of that business, including rawhide gear manufacture. T. G. Meachem and J. F. Meachem are also interested in the new company.

The Medina Toy Co., Medina, N. Y., has been incorporated with a capital of $50,000 by W. E. Stocking, Watson F. Barr and William F. Bennett, to manufacture metal toys, etc.

Philadelphia

PHILADELPHIA, Feb. 24.

The Allen Iron & Steel Co., Third and Venango streets, Philadelphia, is having plans prepared for the erection of a two-story, brick addition, 30 x 50 ft.

The Boyertown Burial Casket Co., 1211 Arch Street, Philadelphia, is having plans prepared for the construction of a one-story addition to its works at Boyertown, 100 x 200 ft.

The Culm Burn Grate Co., Philadelphia, has been incorporated in Delaware, with capital of $250,000 by E. M. Marland, F. R. Hansell, to manufacture furnaces, grates and other heating equipment.

The Peters Engineering Co., 3202 Chestnut Street, Philadelphia, is arranging for the immediate erection of its proposed new one-story shop building at Thirty-third Street and Woodland Avenue, 67 x 157 ft.

The United Mfg. Co., Philadelphia, has been incorporated in Delaware, with capital of $100,000 by Ernest R. Hey, Alfred Kaufman and Frank R. Mitcheson, to manufacture tools.

The Trenton & Mercer County Traction Co., Trenton, N. J., is planning for extensions and improvements in its car barn to provide increased shop and repair facilities.

The Wear Well Tire Co., Newcastle, Pa., has been incorporated in Delaware, with capital of $50,000 by George Largo, J. H. McCann and M. F. Shiffer, Newcastle, to manufacture automobile tires and other rubber products.

Chester Taylor & Co., Harrisburg, Pa., operating a general machine works and repair shop at Seventh and Cowden streets, have moved their plant to a new and larger building at Seventeenth and Derry streets.

The Producers' Supply Co., Franklin, Pa., manufacturer of tanks, engines, etc., is considering the construction of a one-story addition, 60 x 135 ft., to cost about $12,000.

The Macungie Brass & Mfg. Co., manufacturer of brass and bronze products, Macungie, Pa., has been reorganized under the name of the East Penn Foundry Co. The new organization plans for extensions in different departments and will make a specialty of the manufacture of castings for pipeless heaters. The plant will also be devoted to the production of castings for machinery, as heretofore.

...officers are: John G. Fleck, Philadelphia, president; ...ward M. Singmaster, connected with the company for ...time, vice-president; J. Walter Singmaster, treasurer; ...d E. E. Pryor, Reading, secretary. It is understood that ...company will file articles of incorporation under the new ...ne at an early date.

The National Radiator Co., Moxham, near Johnstown, Pa., ...considering the rebuilding of the portion of its works de...royed by fire early in February, with loss of about $15,000.

The Capital City Welding Co., Harrisburg, Pa., will start ...erations of the Lebanon Welding & Brazing Co., Lebanon, ...a., on March 1. Herbert F. Brown is general manager. ...arry Albright, member of the Harrisburg firm, will be in ...harge of the new plant.

The Monitor Bi-Loop Radiator Co., Lancaster, Pa., or...anized six years ago, has increased its capital stock from ...$500,000 to $2,500,000 to care for its enlarged business. V. B. ...ardee is president.

Pittsburgh

PITTSBURGH, Feb. 24.

The A. Garrison Foundry Co., South Tenth and Garri...on streets, Pittsburgh, has filed plans for the construction ...f a one-story addition to its foundry at South Tenth and ...arson streets to cost about $5,000.

The Homestead Consolidated Light, Heat & Power Co., ...omestead, Pa., is planning for the rebuilding of its one-...tory electric power plant, recently destroyed by fire. The ...w plant is estimated to cost about $50,000.

The three plants of the Aetna Chemical Co. at Oakdale, ...ount Union and Emporium, Pa., have been purchased by ...erman Tuch, Pittsburgh, scrap iron broker, for a consid...ration said to be about $500,000. The purchaser will dis...antle the plants at an early date and dispose of the ma...inery and equipment. The Heidelburg works of the com...any are being remodeled for use as an oil refining plant.

The Pearson Mfg. Co., Pittsburgh, operating a boiler and ...ate shop at 800 Beaver Avenue, is operating its plant at ...apacity for the repair of boilers, tanks, stacks, etc. C. C. ...einschmidt is president.

The Girard Model Works, Girard, Pa., manufacturer of ...ire products, is planning for the rebuilding of its one-story ...lant, 50 x 100 ft., partially destroyed by fire.

Following its acquisition of the Marshall Foundry Co., ...ittsburgh, the Valley Mold & Iron Corporation, Sharps...ille, Pa., manufacturer of ingot molds and mold stools, ...as arranged for a bond issue of $750,000 to provide in part ...or the new purchase and for proposed expansion. The ...roperties of the Marshall company have an appraised value ...f $1,150,000.

The Tygarts Valley Motor Co., Elkins, W. Va., is planning ...or the establishment of a machine and repair shop in the ...uilding recently purchased for its new works.

Baltimore

BALTIMORE, Feb. 24.

In connection with the proposed operation of its plant ...or the manufacture of wire wheels, the Maryland Pressed ...teel Co., Hagerstown, Md., has closed negotiations with the ...ational Wire Wheel Works, Geneva, N. Y., for the use of ...s machinery. It is planned to produce about 1000 wire ...heels a day. S. P. Brady is president.

The Bartlett Haywood Co. and the Furst Realty Co., Bal...more, are said to have formed their proposed combination ...or the construction of a large ship repair plant at Fort ...cHenry, where a site of about 100 acres of property has ...een acquired. The drydock will be of sufficient size to ...ccommodate the largest vessels and will be supplemented ...y machine shops, foundry and miscellaneous buildings with ...lectric traveling cranes and complete marine railroad sys...ms controlling the works. It is proposed to dredge the har...r at this point to provide for the entrance of large vessels. ...he entire project is estimated to cost about $4,000,000.

The Hartig Tire & Rubber Co., Washington, D. C., has ...een incorporated in Delaware with capital of $50,000 by ...ouis Hartig, Jr., F. J. Fickling and A. C. Jones, to manu...acture tires and other rubber products.

Lewis S. Fel, Inc., Wilmington, Del., has been incorpo...ated with a capital of $20,000 by Lewis S. Fel, James P. ...allon and Charles C. Speakman to manufacture machinery ...nd hardware.

The American Truck Body Co., Martinsville, Va., recently ...ncorporated with a capital of $100,000, is planning for the ...mediate establishment of a plant for the manufacture of ...eavy automobile truck bodies. A building has been ac...uired.

At an estimated cost of about $500,000, including ma...chinery and equipment, the Seaboard Ice & Cold Storage Co., ...Norfolk, Va., is arranging for the erection of a new ice-...manufacturing and cold storage plant. Plans are being ...prepared.

The Standard Cement Construction Co., Southern Build...ing, Wilmington, N. C., is planning for the immediate estab...lishment of a plant for the manufacture of tanks and other ...specialties.

Fire, Feb. 14, destroyed the planing mill of the J. C. ...Halsema Mfg. Co., Jacksonville, Fla., with loss estimated at ...about $75,000.

E. H. Josselyn, 704 North Durham Street, Baltimore, ...candy manufacturer, will install a 125-hp. boiler and a 50-...hp. engine.

R. P. Johnson, Wytheville, Va., wants prices on second-...hand air compressors and 40- to 60-hp. Corliss engines.

C. H. Turner, Statesville, N. C., plans to build a machine ...shop and wants prices on equipment.

The National Machine & Electric Co., High Point, N. C., ...wants prices on lathes, planers, milling machines, 32 or ...34-in. cupolas and other foundry equipment. T. G. Shelton ...is secretary.

The Lingo Metal Works, Wilmington, N. C., wants prices ...on small upright boilers.

Prices on motors up to 20-hp. are wanted by H. L. & ...W. A. Carver, Rougemont, N. C.

The Raymond Concrete Pile Co., 622 Munsey Building, ...Baltimore, will construct machine shops, marine railway, ...concrete pile-casting plant and a bulkhead on Colgate Creek, ...St. Helena, Md., at a total cost of about $100,000. K. K. ...Kirwan is manager.

The city of Frederick, Md., contemplates the purchase of ...$30,000 worth of water meters. Emory C. Crum is city ...engineer.

New England

BOSTON, Feb. 25.

Contract has been awarded for building three additions ...to the plant of the Simplex Player Action Co., Worcester, ...Mass., a branch of the Hallet & Davis Piano Co., Boston. ...There will be a four-story, 50 x 55 ft. manufacturing building ...of brick with concrete foundations. The other two buildings, ...one story, 35 x 115 ft., will also be of brick and will contain ...a dry kiln.

Repairs are being made on the factory, damaged by fire ...of the Hay & Peabody Casket Co., Portland, Me.

Paolo Gaugagne & Son, Providence, R. I., are erecting a ...workshop, two stories, at a cost of $6,000.

Plans are now completed for a $200,000 fire protection ...system, consisting of a 2,000,000 gal. pump house with all ...equipment of piping, etc., for the U. S. Naval Station, Hing...ham, Mass.

A small mill structure, one story, 28 x 31 ft., tile and ...steel, is being erected by the N. E. Fuel & Transportation ...Co., Everett, Mass.

Bids will be received later on the steam heating for the ...$40,000 new plant, two stories, 70 x 70 ft., one story, 20 x 80 ...ft., one story, 30 x 70 ft., for the East Harbor Fertilizer Co., ...Springfield, Mass. The plant now being built at North ...Truro, Mass., is of reinforced concrete and includes a boiler ...and engine house, oil house, etc.

Plans now in preparation for rebuilding the plant of the ...Milford Pink Granite Co., Milford, Mass., include a power ...house and blacksmith shop, one story, 50 x 80 ft. Commer...cial power is contemplated.

A brick and concrete structure, two stories, 45 x 125 ft., ...is being built at the plant of the W. T. Barnum Co., New ...Haven, Conn.

Bids have been received for the new hardening shop, one ...story, 90 x 300 ft., of the New Departure Co., Bristol, Conn.

A factory addition, one story, 80 x 250 ft., has been con...tracted for by the General Ordnance Co., Derby, Conn.

The Scovill Mfg. Co., Waterbury, Conn., will erect a ...factory addition, one story, 124 x 197 ft., to cost $50,000. It ...will be of brick, concrete and steel.

The former plant of the Ames Plow Co., Framingham, ...Mass., has been acquired by the B. F. Sturtevant Co., Hyde ...Park, Boston. The plant, with main building, 200 x 320 ft., ...will be remodeled and improved, and will be used by the new ...owner for its main foundry. The works will be equipped to ...manufacture iron and brass castings, with production of about ...100 tons per day. The entire output of the plant, it is under...stood, will be utilized by the company for its regular line of

fans, blowers, etc. About 500 men will be employed for initial operations.

The French Ivory & Metal Co., Providence, R. I., has been incorporated with a capital of $10,000 by William B. Sherman, Hugo Manovill, and John I. Devlin, to manufacture metal and other specialties.

The Snell Mfg. Co., Fiskdale, Mass., manufacturer of carpenters' tools, bits, augers, etc., is operating its plants at Fiskdale and East Brimfield on full time of 55 hr. per week, with present working force aggregating about 175 men. It is planned to maintain this production for some time. Recent improvements have been made in the local plant, including the remodeling of the forge department for a grinding works. L. S. Whitney is general manager.

The Bancroft Razor Co., 5 Cypress Street, Worcester, Mass., manufacturer of cutlery, has sold its business, and the company will be dissolved.

The Horton-Angell Co., Attleboro, Mass., has been incorporated with a capital of $215,000 by Clarence L. Watson, Walter A. Cunningham and Thomas F. Manning, to manufacture metal products.

The Worcester Shock Absorber Co., Commercial Street, Worcester, Mass., a subsidiary of the Worcester Mfg. Co., has been operating its plant for the manufacture of steel tubing for the Ordnance Department, aggregating about $163,000 in value.

The Fleming Machine Tool Co., Springfield, Mass., has been incorporated with a capital of $100,000 by George W. Fleming, Isaac T. McGregor and Frederick G. Wooden, to manufacture machine tools.

The American Bosch Magneto Corporation, New York, is planning for the removal of its headquarters to the Springfield, Mass., works. The sale of the former property of the Bosch Magneto Co. to the new corporation has been completed, with total consideration of about $850,000, covering plants, patents, etc. The New York office, following the change, will be operated as a branch.

Milwaukee

MILWAUKEE, Feb. 24.

From a local viewpoint the increasing activity in various branches of the metal-working industry is regarded by machine-tool manufacturers as a hopeful sign, since the condition is reflected in commitments placed here and elsewhere. So far the demand for milling machines is relatively better than that for other classes of machine tools and buying is rapidly approaching normal activity. While the main source of demand is the automobile and tractor industry, manufacturers in other lines are coming forward with inquiries and orders.

The labor situation is not serious in this market, although unemployment is abnormal. A survey of 45 local metal-working concerns shows that on Feb. 1 the number of employees was 32,835, compared with 35,629, Nov. 1, 1918, which is a reduction of 2794, more than 1000 of whom are women. In numerous industries of lesser importance the number of operatives shows an increase on the same comparative basis.

The Northern Boiler & Structural Co., Appleton, Wis., has acquired additional frontage on Lake Street, which is intended for use as the site of a new boiler shop to be erected in the spring at an estimated cost of $35,000, including equipment. Announcement of details awaits the return of William H. Timm, president and general manager, from a two months' trip to the Northwest Pacific Coast.

The Bark River Bridge & Culvert Co., Madison, Wis., manufacturer of corrugated metal culvert tubes and similar material, will build a new shop, 40 x 80 ft., on property leased from the Illinois Central Railroad at Madison.

The Wisconsin Machinery & Mfg. Co., Milwaukee, has increased its capital stock from $50,000 to $100,000 to finance the expansion of its business. The company manufactures detachable rowboat motors and mechanical appliances. The works at Fifty-first and Burnham streets, West Allis, will probably be enlarged the coming summer. Louis E. Vogel is president and general manager.

The Parker Pen Co., Janesville, Wis., manufacturer of fountain pens, clips, etc., has engaged Frank A. Carpenter, architect, Rockford, Ill., to design a new plant and office building involving an investment of $100,000 including equipment. Bids probably will be taken about March 15 or April 1. George S. Parker is president.

The K. & T. Specialty Co., Kenosha, Wis., will build a new factory costing about $20,000 with equipment. Plans are being prepared by White, White & White, architects, Kenosha, and will be ready for contractors after March 1.

The Carl Hartmann Co., Green Bay, Wis., manufacturer of marine engines and machinery and operating a general ship repair yard, will spend from $250,000 to $300,000 in the construction of a new floating drydock, power house and auxiliary buildings. Details will be announced about March 15. Carl Hartmann is president and general manager.

The General Mfg. Co., 1520-1528 Buffum Street, Milwaukee, recently incorporated with a capital stock of $100,000, has taken over the plant and equipment of the Minn Billiard Co., Milwaukee, and will specialize in the manufacture of talking machines and phonographs, besides continuing the present line of billiard tables, cabinet work, etc. Some new power and wood-working machinery and other equipment will be installed and an addition probably will be necessary before mid-summer. The principal owners of the new company are Walter H. Schwab, formerly head of the Auto Parts Mfg. Co., and Edward A. Heaney, former president Milwaukee Talking Machine Company.

The Two Rivers Plating Co., Two Rivers, Wis., sustained an estimated loss of $25,000 by the destruction of its plant and most of its equipment by fire on Feb. 15. Arrangements are being made to erect a new shop early in the spring. The investment will be about $30,000.

Leicher Brothers, Loganville, Wis., who have been constructing truck units for motor car chassis on a small scale in connection with their public garage and machine shop business, have purchased a site and will build a new machine shop, 30 x 120 ft. The present shop and garage have been sold to William Hammermeister.

The Prest-O-Lite Co., Indianapolis and New York, has awarded the general contract to the Worden-Allen Co., Milwaukee, for the construction of a new brick and steel compressing building, 35 x 114 ft., at 619 Trowbridge Avenue, Milwaukee, to replace the unit destroyed by explosion and fire in December. D. J. Brown is manager of the Milwaukee branch.

The Folding Furniture Co., Stevens Point, Wis., now occupying a part of the plant of the Bukolt Mfg. Co., will build a new plant costing $35,000 early in the spring. The Bukolt company, which manufactures steel-shod tire protectors and similar specialties, will purchase much new equipment as soon as the space is vacated. John J. Bukolt is president and general manager.

The Wisconsin Textile Mfg. Co., Two Rivers, Wis., manufacturer of wood and metal devices and appliances for textile mills, has increased its capital stock from $25,000 to $50,000. The company recently absorbed the Alberts & Meyer Mfg. Co. and is doubling its output.

The Manitowoc Plating Works, Manitowoc, Wis., will break ground about April 1 for the erection of a new shop, 50 x 100 ft., costing about $20,000 with equipment. The work is in charge of L. K. Pitz, consulting engineer, Manitowoc. W. J. Wachowitz is general manager.

The Monarch Tractor Co., Chicago, with main works at Watertown, Wis., is contemplating the erection of an addition to its machine shop and a new warehouse. Definite details are not yet ready. W. N. Smith is president.

The Lawson Aircraft Co., Green Bay, Wis., has vacated the building erected for its occupancy about two years ago and is now located in the former plant of the Green Bay Drive Calk Co. The space thus released will be taken over by the Northwest Engineering Works, Green Bay, Wis., for machine shop purposes in connection with its shipbuilding plant.

The James Mfg. Co., Ft. Atkinson, Wis., is contemplating the erection of an iron foundry. It manufactures steel stanchions and other barn equipment and is now purchasing its supply of castings.

The Wisconsin Shipbuilding & Navigation Corporation, Milwaukee, which was organized in 1918 with an authorized capital stock of $5,000,000, has completed arrangements to establish a steel shipbuilding plant at Kewaunee, Wis. At a meeting of citizens of Kewaunee with representatives of the corporation, it was agreed to raise $100,000 to supplement a similar fund created by stockholders to finance the initial construction on a 40-acre site on the harbor, which has been donated by the local Commercial Club. The yard will have a capacity of six vessels per year, and it is stated that contracts have been received which will keep the plant occupied for nearly two years. J. W. Barber, Milwaukee, is secretary.

The Fairport Mfg. Co., Milwaukee, recently incorporated with a capital stock of $50,000, intends to build a factory in Bay View for the manufacture of musical instruments and supplies. P. J. Fischer, 241 Rusk Avenue, is secretary and treasurer.

The Conradson Machine Tool Co., Green Bay, Wis., organized by C. M. Conradson to manufacture turret lathes and other machinery, is rebuilding structures on a 10-acre site recently acquired into a machine shop, assembling shop

warehouse and, beyond erecting a new office building, defer new construction until later in the year or early 1920. The capital stock is $300,000, which has been subscribed largely by Green Bay people. It is hoped to begin production about April 1 or 15.

The Sterling Wheelbarrow Co., Milwaukee, is preparing to make an addition to its plant, containing as much floor area as the present plant.

The Globe Seamless Steel Tubes Co., Thirty-third Avenue and Burnham Street, Milwaukee, Wis., is interested in buying a crane of 64-ft. span or larger and of 10 to 15-ton capacity. Joseph H. Phillips is purchasing agent.

Chicago

CHICAGO, Feb. 24.

The week has been rather slow with the distributors of machine tools and nearly all attribute the relative inactivity to the more pronounced determination of users to wait for lower prices. Those who contemplate buying make inquiry and frequently look at tools, but do not come to the closing point and frankly admit they believe they will get a better price by waiting. Some of the contemplating buyers, especially those larger ones whose needs are the more urgent, are content with a stipulation that they will be reimbursed for any decline that may come by July 1, but others say they will not purchase if war prices are named. In a few instances reductions in price have been announced by tool builders one having lowered his price 15 per cent, and another 22 per cent.

It is generally conceded that action will not result from any small reduction, also that prices may be lowered quite a bit before pre-war prices are approached. At the same time it is pointed out that tool builders are using material for which they paid top-notch figures, also that labor costs are as much as ever. Such reductions as have been made in the cost of raw material, even if this material were used to-day, would cut but little figure in the total cost of a completed machine.

Second-hand tools are being offered in great quantity, but despite this fact conditions are not bad in this market, except with some types of tools, notably engine lathes. A Pittsburgh machinery house is canvassing the country to find buyers for a large number of lathes, 50 of one size being offered, 21 of another, while in addition there are 13 large turret lathes. All have been used but six months and are in good condition. Dealers are scanning very closely the quantity of machines of each kind which are being offered, this phase being considered of far more importance than the condition of the tools.

The Government officials in charge of the Cribben & Sexton equipment, which was bought for shell work but never used, finished taking bids Feb. 15, but since then uncertainty has developed as to whether any of the bids will be accepted, it now being reported that, on orders from Washington, all bids and certified checks will be returned. It has puzzled many to know why Government officials should have singled out the Cribben & Sexton equipment for disposal ahead of some other lots.

The Mid-West Engine Co., Indianapolis, Ind., has disposed of about 200 tools which it used in the manufacture of marine engines for the Navy, all being taken by a local machinery house. Some of this equipment was many years old, and part of it will be replaced with new and modern tools.

The market, though quiet, is by no means dead. The Interstate Iron & Steel Co. is inquiring for two or three machines, the Rock Island Arsenal wants a couple of large planers, the Pennsylvania Lines are in the market for tools required at its Logansport, Ind., shops; and two automobile companies are figuring on small lots of tools.

The demand for pipe cutting and threading machines is fairly good, the call coming principally from shipyards and marine boiler plants.

The Bryan Harvester Co. is moving its shops from Albuquerque, N. M., to Peru, Ind., where it will build steam tractors and a steam truck in the old Hoffman-Smith building. It contemplates the purchase of a few machines.

Bids will soon be taken by Fridstein & Co., engineers, 53 West Jackson Boulevard, Chicago, on a three-story addition, 150 x 140 ft., and a two-story addition, 34 x 200 ft., to a factory at Fifty-second Avenue, north of Twenty-second Street, for the Vitanola Talking Machine Co., 503 West Forty-fifth Street, Chicago. The foundations are being designed to carry six stories, to permit of future expansion, with minor improvements to be made, the cost of the additions will be around $250,000.

Marshall Field & Co., Chicago, will build in the Kenwood Mfg. District a $200,000 plant for the manufacture of burlap bags. The plans provide for a day-light factory 133 x 500 ft., of saw-tooth construction. Mundie & Jensen, architects for the district, have prepared the plans.

The Decatur Fountain Co., Decatur, Ill., maker of soda water apparatus, plans to resume operations, after being on a war basis, and will install machinery in buildings owned by the Mueller Mfg. Co., by which it is controlled. The move will utilize some of the buildings which the Mueller company has been using for war work.

The capital stock of the Frost Gear & Forge Co., Jackson, Mich., has been increased from $350,000 to $750,000, and a factory addition, 75 x 150 ft. will be built. It will be of steel with a concrete basement.

The John M. Ryan Foundry Co., Rock Island, Ill., has been equipped for the manufacture of brass, aluminum and bronze castings. It will be devoted largely to the production of automobile crank cases.

The Ocean Floating Safe Co., 4520 West Grand Avenue, Chicago, is planning the construction of a second factory building to cost about $50,000, and is prepared to receive propositions covering its design, etc. It is also interested in buying machinery suitable for the manufacture of its products, and it is open to proposals relating to the engineering features of such installation.

The Ilg Ventilating Co., Whitney Street, Chicago, manufacturer of ventilating equipment, fans, blowers, etc., is planning for the erection of a new plant on property recently purchased at George Street and Crawford Avenue, for a consideration of about $80,000. The new works will be constructed on the unit plan, the initial unit to cost in the neighborhood of $250,000. R. A. Ilg is general manager.

The Howe Safety Appliance Co., Granite City, Ill., manufacturer of press guards, etc., a Delaware corporation, has increased its capital from $500,000 to $1,000,000.

Gustaf Lidseen, 224 Desplaines Street, Chicago, will make alterations and additions to his one-story machine shop, 75 x 300 ft., at 832 Central Avenue, to cost about $10,000.

The Emergency Fleet Corporation, Washington, has leased the plant of the Studebaker Co., Seventy-sixth and Wallace streets, Chicago, for its local headquarters. The plant provides about 270,000 sq. ft. of space.

The Isko Co., 111 West Washington Street, Chicago, manufacturer of refrigerating machinery, has leased a section of the plant at the Northwestern Terra Cotta Co., Terra Cotta Place and Clybourne Avenue, comprising about 60,000 sq. ft. of space, for the establishment of a new plant.

Detroit

DETROIT, Feb. 24

A steady increase in inquiries and sales is reported by machine-tool dealers in this district. Since the first of the year demand has gained consistently. Pre-war demand is already surpassed, and dealers expect an even greater increase in the next two months. Automobile and accessory manufacturers are doing most of the buying at present. The Ford Motor Co. placed an order last week for $1,000,000 worth of machinery; other motor concerns have ordered a total of over $1,500,000. Milling machines, grinders, shapers and planers are in the greatest demand. Deliveries are reported in from four to six weeks.

The unemployment situation is steadily improving and a shortage of labor is predicted within three or four months. Opinions of 50 men in different lines of business showed a practical unanimity in the belief that by late spring Detroit will enter the greatest period of industrial prosperity in its history. Many manufacturers report more orders than at any time previous to 1914.

Construction permits are increasing each week. Large projects of the General Motors Corporation, including enlargement of the Reo plant at Lansing, Mich., the purchase of another Lansing plant, the erection within a short time of a new factory for the Cadillac Motor Co., Detroit, and further additions in Pontiac, Bay City, Saginaw, and Flint are in sight, according to persistent reports.

The D. J. Ryan Foundry Co., Detroit, has been formed with a capital of $500,000 being paid in full in property. The shares are held by Frank E. Cole, Byron D. Everitt and Gordon D. Everitt. Mr. Cole is head of Frank E. Cole & Co., accountants, and Byron Everitt, and Gordon Everitt are president and secretary-treasurer, respectively, of Everitt Brothers.

The plant of the Ypsilanti Hay Press Co., Ypsilanti, Mich., of which John S. Haggerty, Detroit, is president, was partially destroyed by fire a few days ago, the damage being estimated at $25,000.

The Homer Furnace Co., Homer, Mich., is said to be planning to move to Coldwater, Mich., owing to the lack of houses for its workers. The company, it is said, will maintain the Homer plant as a branch.

The Potato Implement Co., Traverse City, Mich., has plans for the erection of an addition to cost $25,000, which will double the floor space.

The Wilson Foundry & Machine Co., Pontiac, Mich., will build an addition, 100 x 800 ft., within 90 days. C. B. Wilson is president.

The South Park plant of the Romeo Foundry Co., Romeo, Mich., has been destroyed by fire with a loss of $100,000. Lyman A. Holmes is president.

The Hudson Motor Car Co., Detroit, is reported to have authorized the expenditure of $1,000,000 for equipment. The company plans to construct 20,000 Essex cars this year at the same time maintaining its production of Hudsons.

Cleveland

CLEVELAND, Feb. 24.

New machine-tool inquiry from the automobile field continues fairly active. A number of the larger companies are buying small lots of machines to take the place of worn-out or out-of-date equipment. The Dort Motor Car Co., Flint, Mich., placed orders the past week for 7 screw machines and a considerable amount of other equipment. The General Motors Corporation has bought additional machinery for its Toledo-Chevrolet plant, and is expected to place large orders this week for its Detroit and Janesville, Wis., plants. The Woodward Iron Works, Birmingham, Ala., is inquiring for screw machines and bolt-cutting and grinding machinery. This company has purchased a round lot of lathes in the East. The Cleveland Automobile Co., which will build a plant for the manufacture of moderate-priced cars, will require considerable equipment.

The Cleveland Ordnance Department is expecting directions from Washington shortly in respect to the disposal of Government machinery in this section. It is estimated that the machinery in the district comprising northern Ohio and the three Western counties of Pennsylvania, including the city of Erie, will amount to about $20,000,000. This includes machinery actually owned by the Government and that turned in by manufacturers who have claims because of the cancellation of contracts. A great deal of machinery used in Government work and owned by the manufacturers is still coming on the market. The equipment of the $1,000,000 plant of the Dayton Metal Products Co., Dayton, Ohio, is being offered for sale by the Biggs-Watterson Co., Cleveland.

The Cleveland Automobile Co., Cleveland, recently organized by interests associated with the Chandler Motor Car Co. to manufacture a line of medium-priced automobiles, has acquired several acres on Euclid Avenue, near the works of the Cleveland Tractor Co., and will commence construction as soon as possible on a plant 190 x 600 ft., four stories. Plans are being prepared by Ernest McGeorge, engineer, Cleveland.

The Carroll Foundry & Machine Co., Bucyrus, Ohio, the control of which was recently acquired by Cleveland interests, has been reorganized by the election of Thomas E. Monks, president; W. E. Matthew, vice-president; Sheldon A. Cary, secretary-treasurer; F. R. Ambrose, assistant secretary, and Robert S. Carroll, assistant treasurer.

The National Machine Products Co., 10,112 Tanner Avenue, Cleveland, has been incorporated with a capital stock of $25,000. H. H. Baker is at the head of the company, which will manufacture machine-screw products.

The Austin Co., Cleveland, has taken a contract for a $500,000 plate glass plant, to be erected at Maubeuge, France, to replace one destroyed by the Germans. The plant will be a branch of the Pilkington Brothers Co., Ltd., St. Helena's, England.

The Republic Brass Co. and the Monarch Brass Co., Cleveland, makers of plumbers' brass goods, will be merged under the name of the Republic Brass Co., which has increased its capital stock from $25,000 to $160,000. The merged company will occupy the plant of the Monarch company.

The Joseph L. Skeldon Engineering Co., Toledo, Ohio, has arranged to handle the output of the McNaull Boiler Mfg. Co., Toledo, and has appointed T. F. Whittelsey, formerly sales manager of the Heine Safety Boiler Co., sales manager in its boiler department. The Skeldon company has moved its Toledo plant to new quarters in the Quayle Building, Madison Avenue and Water Street. It has recently taken contracts for two power plants for the New York Central Railroad, in addition to considerable other power and lighting plant work. It is stated that the company will open offices in Cleveland and Pittsburgh.

The Toledo Screw Products Co., Toledo, Ohio, has purchased the plant formerly occupied by the Ohio Electric Co., to which it will move shortly. The new factory is to x [illegible] ft., two stories.

The Toledo-Chevrolet Co., Toledo, has commenced the erection of an addition, 125 x 125 ft., two stories. It will be used for a machine shop and will be the first unit of the extension program planned by the company.

The erection of a new power plant by the Lorain Coal & Electric Co., Lorain, Ohio, which was held up about a year ago, will be resumed. It is stated that the Government has advanced $500,000 for the completion of the plant, which will supply power for industrial purposes in Elyria and other adjoining cities, in addition to Lorain.

The Gilliam Mfg. Co., Canton, Ohio, has commenced the erection of a two-story addition, 25 x 100 ft., which will be occupied by a taper roller bearing department.

The Solid Steel Scissors Co., Fremont, Ohio, has commenced the erection of a new plant. The main factory will be 32 x 120 ft., two stories.

The Williamson Hydraulic Clutch Co., Mt. Vernon, Ohio, recently incorporated, has commenced the manufacture of an automobile clutch. P. D. Worley is president and H. [illegible] Gardner, secretary-treasurer.

The Biggs Boiler Works Co., Akron, Ohio, is having plans prepared for an addition, 40 x 330 ft.

Cincinnati

CINCINNATI, Feb. 24.

The demand for boring mills from rubber tire manufacturers is exceptionally good. These are bought in single lots mostly and orders for more than two or three are rarely received. Automobile manufacturers are putting out some inquiries for machine tools. Gas engine makers are also in the market for single tools, but inquiries are slow developing into orders. It is stated that would-be purchasers of machine tools are holding off on account of present prices. With the exception of a recent readjustment of prices on shaping machines, none has been made or contemplated by machine tool makers.

Foreign inquiries are probably not as numerous as in the previous week, but quite a lot of business is under negotiation with French, Belgian and Italian firms. An inquiry from Spain for portable electric tools has also been received.

Railroad car manufacturers in this vicinity are quite busy and recent orders received by the Ralston Steel Car Co., Columbus, Ohio, enabled that company to add several hundred men to its payroll. It is also contemplating the installation of additional equipment in its shops.

The Cincinnati Rubber Mfg. Co., Norwood-Cincinnati, has increased its capital stock from $250,000 to $500,000, and will increase the capacity of its plant at a later date.

The Long & Allstatter Co., Hamilton, Ohio, maker of punching and shearing machines and agricultural implements, has increased its capital stock from $200,000 to $800,000. It recently completed the construction of a foundry adjoining its main plant on High Street.

The Iron City Foundry Co., Hamilton, will build an addition to its plant at an early date.

The R. & M. Co., Dayton, Ohio, has been incorporated with $10,000 capital stock by John W. Rogge, John B. Mann and others, to operate a machine shop and metal stamping plant.

The Ortman Motor Co., Washington Court House, Ohio, has increased its capital stock from $50,000 to $100,000.

The Rainbow Tire & Rubber Co., Delaware, Ohio, has been incorporated with $250,000 capital stock by Charles B. Rose and others. Nothing is known as to the company's manufacturing plans.

The Colonial Foundry Co., Louisville, Ohio, capitalized at $65,000, has purchased the plant of the Bonnot Co., which will be remodeled for general foundry purposes. C. M. Converse is president.

The Central Stamping & Metal Spinning Co., Dayton, has been incorporated with $10,000 capital stock by James F. McBarron, and others.

The Gas Products Co., Columbus, has been incorporated with $150,000 capital stock by George S. Butler, and others. An acetylene gas plant will be established.

The Safe Cabinet Co., Marietta, Ohio, contemplates increasing its capital stock and adding equipment to its plant at an early date.

The New Way Husker Co., Greenville, Ohio, has been incorporated with $100,000 capital stock by A. W. Evers and others to manufacture hardware specialties.

The Service Motor Truck Co., Wabash, Ind., manufac-

of motor trucks, has increased its capital from $750,- to $1,000,000.

The Indiana Wheel Structure Co., Waldron, Ind., has been incorporated with a capital of $30,000 by Earl E. McNeely, Homer and Clyde Avery, and Claude C. Curtis, to manufacture a patented wheel for automobiles.

The Bingham Electric Co., South Bend, Ind., has been organized by C. E. Rogers, Ralph Bingham, and George M. Bingham to manufacture electrical supplies.

The Evansville Atomized Fuel Co., Evansville, Ind., recently incorporated with a capital of $250,000, is planning the establishment of a plant for the manufacture of a patented fuel. William E. and John J. Tuite, and Fred Bamm, Indianapolis, head the company.

The Central South

LOUISVILLE, Feb. 24.

Machinery houses in this vicinity are deriving a fair volume of business from coal and oil interests of the State, which have been developing rapidly.

The Hall Engineering Co., Third Street and Central Avenue, Louisville, is in the market for a 26-in. drill press and a No. 2 milling machine. The company manufactures deep well pumps and conveying equipment.

The Roy C. Whayne Supply Co., Third and Main streets, Louisville, is in the market for a ⅝ or ¾ revolving steam shovel, mounted on tractor wheels; second-hand preferred.

It is reported that Hoyt & Hiestand, Pekin, Ind., will rebuild their burned sawmill at a cost of $15,000.

Lancaster, Wallace & Neilson, Lebanon, Ky., have purchased the plant of the Lebanon Hardwood Flooring Co. and will purchase new machinery, including new motors and power plant equipment.

The Reciprocity Electric Tool Co., Louisville, has increased its capital stock from $10,000 to $100,000.

Grainger & Co., Louisville, architectural steel workers and manufacturers of steam pumps, have increased their capital stock to $200,000.

The Continental Car Co., Highland Park, Ky., manufacturer of mine cars, auto truck bodies, etc., has purchased additional land and contemplates enlarging its plant.

The Bridge & Beach Mfg. Co., Main and Valentine streets, St. Louis, will erect a new plant for the manufacture of stoves.

A controlling interest in the Savidge Tractor Co., Alton, Ill., has been acquired by interests affiliated with the Missouri Pressed Steel Co., and it is announced that the Savidge tractor will be manufactured at St. Louis. The capital stock of the reorganized company will be increased to $1,000,000.

The American Brake Shoe & Foundry Co., Chattanooga, Tenn., has closed a department at its works temporarily, heretofore giving employment to about 30 men. It is expected to inaugurate operations as soon as orders for material are received. The Wheland Co., manufacturer of sawmill machinery, has also abandoned operations in one of its departments, releasing about 17 men. The Ross-Meehan Foundries, manufacturers of castings, is now operating at capacity and expects to continue on this basis for some time.

The Colonial Mfg. Co., Chattanooga, Tenn., manufacturer of gas burners, etc., has increased its capital to $25,000.

The City Mill & Lumber Co., Louisville, is planning for the rebuilding of its planing mill recently destroyed by fire. The cost is estimated at $20,000.

St. Louis

ST. LOUIS, Feb. 24.

The Lamb-Fish Lumber Co., Charleston, Miss., is in the market for machinery for a lift span of 74 ft. on a bridge across the Tallahatchie River.

The New Orleans Butchers' Co-operative Abattoir will equip a packing house at New Orleans and is in the market for power plant machinery.

The Farmers' Gin Co., Morrillton, Ark., is reported in the market for about $15,000 worth of gin machinery and power plant equipment.

The Forman Light & Water Co., Forman, Ark., is in the market for about $25,000 worth of electric light and waterworks plant machinery.

The Arkansas Light & Power Co., Pine Bluff, Ark., H. C. Couch, president, will increase its capital by $750,000 to add to plant facilities and capacity.

The city of Port Clinton, Miss., is in the market for about $25,000 worth of electric light plant machinery.

The Bristow Ice & Light Co., Bristow, Okla., will add to its electric light and waterworks plant equipment and is in the market for the machinery.

The city of Stillwater, Okla., has voted to expend $30,000 for electric light and power plant machinery to extend the capacity.

The town of Woodward, Okla., has voted $30,000 for electric light and waterworks plant machinery.

The Long-Bell Co., Quitman, Miss., will equip a 20-ton ice plant and is receiving bids for the machinery.

The Mississippi Planing Mill Co., Meridian, Miss., C. H. Poythress, and others, interested, is in the market for about $10,000 worth of planing mill machinery.

The Nomus Mfg. Co., St. Louis, L. B. Hornell, W. J. Miller, and others, interested, will equip a plant with about $30,000 worth of machinery for the manufacture of metal ice cream freezers.

The St. Louis Wire & Iron Co., St. Louis, 926 Chouteau Avenue, will equip an addition to its plant requiring about $35,000 worth of new machinery.

The Little Rock Battery Co., Little Rock, Ark., has increased its capital and will install about $25,000 worth of new machinery for the manufacture of batteries, etc.

The city of Duncan, Okla., the Benham Engineering Co., Oklahoma City, in charge, will receive new bids for about $10,000 worth of sewage disposal plant machinery.

Tulsa, Okla., will install a horizontal, cross-compound crank and flywheel pumping engine with a daily capacity of 12,000,000 gal. Charles F. Burke, city auditor, may be addressed.

The Lock-Moore Lumber Co., West Lake, La., is in the market for one 48 x 96 vertical boiler and one 75 to 100-hp. marine boiler, also engines, dynamos and motors.

California

SAN FRANCISCO, Feb. 18.

A number of small shops throughout the State, which have been unable to obtain needed equipment for the past two or three years, are expected to be in the market for machine tools in the near future. Many orders will doubtless be for the smaller machine tools, but in the aggregate will probably amount to a large sum of money. The general sentiment of the machinery trade is optimistic. While many buyers are looking for lower prices this is not expected to hold up orders once the wage and hour question is agreed upon.

The Chevrolet Motor Co., Oakland, has started improvements to its plant totaling $200,000. The addition will be 60 x 400 ft., three stories with basement, and will be used as an assembling plant for the heavier cars and trucks. The company also contemplates adding another wing to its factory at a cost of $150,000.

Westhars & Barton, Visalia, Cal., are erecting a machine shop.

T. B. Martin, formerly of Porterville, is installing machinery for a brazing and welding shop at Tulare, Cal.

The Crawford-Saunders Airplane Co., Venice, Cal., is said to be looking for a factory site in Fresno for the construction of airplanes.

The Killefer Mfg. Co., 2209 Santa Fe Avenue, Los Angeles, manufacturer of agricultural machinery, is considering the erection of a new plant.

The California Panomassage Mfg. Co., Pasadena, has been incorporated with a capital of $1,000,000, by Paul G. Andrews, Charles J. Damm, Jesse J. and Irvine D. Eubanks, to manufacture massage apparatus.

The W. H. Jahns Machinery Co., 2660 Lacy Street, Los Angeles, manufacturer of tools, automobile parts, etc., will build a one-story brick addition to its plant.

The San Diego & Arizona Railway Co., San Diego, has filed plans for the construction of new shop buildings at 1615 Newton Avenue, to cost about $19,500, exclusive of equipment.

The Crown City Auto Radiator Works, 43-45 East Union Street, Pasadena, has filed notice of organization to manufacture automobile radiators and similar specialties. Joseph Auch, 45 North Lake Avenue, heads the company.

The Hunter Tool Co., Los Angeles, has been incorporated with a capital of $10,000, by H. H. Hunter, Los Angeles; G. L. Knox, Glendale, and G. E. Moreland, Huntington Park, to manufacture tools and similar products.

C. C. Benjamin, San Diego, has made application to the City Council to build a one-story plant on the city tidelands for the manufacture of automobile equipment. The initial equipment installation is estimated to cost $10,000.

The Mason Mfg. Co., Los Angeles, has been incorporated with a capital of $25,000, by F. G. Mason, William P. Vogler, and Thomas McElwee, to manufacture lamps, metal novelties, etc.

The Board of Directors, Modesto and Turlock Irrigation Districts, Modesto, Cal., has had preliminary investigations made covering the construction of its proposed hydroelectric project on the upper Tuolumne River. The entire work as now planned will cost $3,439,000, $609,000 of which is estimated as the cost of the hydroelectric plant, including machinery and auxiliary apparatus. The proposed plant will have an initial capacity of 12,000 kw.

The Walter W. Murphy Sales Co., 285 West Colorado Street, Pasadena, will build a one-story brick machine shop as an addition to its automobile establishment at a cost of about $10,000. It will be equipped for repair work and for the manufacture of small motor parts.

The American Gear & Transmission Co., Los Angeles, has filed notice of organization to manufacture gears, etc. W. H. Reithmaier, 318 West Elk Street, Glendale, heads the company.

The Flowers Mfg. Co., Fresno, has been incorporated with a capital of $10,000, by W. A. Flowers, and L. M. Buckland, 2515 Ventura Street, to manufacture metal cap locks, motor meters and other metal specialties.

Texas

AUSTIN, Feb. 22.

The Donna Irrigation District, Donna, will devote the proceeds from the sale of $500,000 in bonds to extending the canal system, installing pumps and other equipment.

The Riverside Oil & Refinery Co., Oklahoma City, Okla., plans to construct an oil refinery at Waco to cost about $1,000,000.

The Gulf Well Machinery Mfg. Co., Houston, contemplates building a plant at Abilene for the manufacture of oil well drilling machinery. The proposed industry will cost about $250,000.

The Otis Gin & Warehouse Co. has been incorporated at Carlsbad, N. M., with a capital of $50,000 and will build a four-stand gin and warehouse. T. E. Williams is president.

The Home Oil Refining Co., Fort Worth, has been incorporated with a capital stock of $5,000,000. It has taken over the holdings of the W. P. Mason Refining Co. and O. K. Refining Co. and will move a refinery which it acquired at Niotaze, Kan., to Fort Worth. The plant will be enlarged to a daily capacity of 5000 bbl.

H. Green, Waco, and associates will build a cold storage plant to cost about $100,000.

The Mattison Oil & Refining Co., San Antonio, which is a joint stock concern recently organized with a capital of $500,000, plans to construct an oil refinery at that place. Edward Mattison, Minneapolis, Minn., is interested.

The Prairie Pipe Line Co. is laying a second reinforced oil pipe line between Ranger, Tex., and Drumright, Okla., and will equip pumping stations.

The Pacific Northwest

SEATTLE, Feb. 18.

The lumber situation shows considerable improvement, a number of mills resuming operation in the camps and at the sawmills. During the long shut-down, many plants made extensive repairs and improvements, and are ready to enter the spring trade with increased capacity. Demands throughout the State are beginning to come in heavy volume, and the mills report a steady run of orders.

The Pacific Coast Grinding & Machine Co., Seattle, is constructing a plant in Seattle at a cost of $500,000, to manufacture a special type of wrench. It will have a daily capacity of 5000. Work will be undertaken in the near future.

The Albina Engine & Machine Works, Portland, has been advised that contracts for two to four 3800-ton steel vessels, on which work had been ordered suspended, have been reinstated by the Emergency Fleet Corporation.

J. M. Maggs, 1611 Eighth Avenue, Seattle, plans the construction of a one-story foundry to cost $2,500. New machinery will be installed.

The Astoria Pulp & Paper Co., Astoria, Ore., will make improvements to its plant that will double the capacity and cost about $250,000. Considerable new machinery will be installed. Paul Jones is general manager.

The East Waterway Dock & Terminal Co., Seattle, will build a one-story reinforced concrete shop 25 x 50 ft., at a cost of $5,000. New equipment will be installed.

The Mainland Engineering Co., Vancouver, B. C., contemplates erecting a new plant on George Street, which will include a two-story pattern shop, 50 x 60 ft., boiler and blacksmith shop, 54 x 125 ft., foundry, 60 x 100, machine shop, 60 x 100. The building will represent an expenditure of about $70,000 and a large amount of new equipment will be installed. Gardiner & Mercer, Vancouver, are preparing plans

The A. F. Coates interests, Bay City, Ore., recently purchased the Miami Lumber Co., Tillamook, Ore., and will immediately reconstruct the sawmill, which has been idle for eight years. When completed it will have a daily capacity of 175,000 ft.

The Oregon Milk Producers Association, Inc., Portland, will erect a $50,000 plant which will be equipped with cooling, pasteurizing and refrigerating equipment.

The Clarkson Mfg. Co., 2204 Mallon Avenue, Spokane, Wash., has been organized to manufacture logging supplies, including blocks, swivels, undershot waterwheels, etc. W. B. Vestal is secretary and general manager.

Canada

TORONTO, Feb. 24.

Work will be started in the spring on a foundry and machine shop for the United Iron & Machine Co., Ltd., Haileybury, Ont., to cost $75,000. A. B. Ullhorn, Haileybury, is engineer.

Excavation has started for a forge shop at Leaside, Ont., for the Canadian Northern Railway Co., 1 Toronto Street, Toronto. G. C. Briggs, 27 Wellington Street East, Toronto, is architect.

The Quebec Central Railway Co., Wellington Street, Sherbrooke, Que., will build a one-story carpenter shop to cost $42,000. H. G. James, Room 7, Whiting Block, is the architect.

The Canadian Pacific Railway, Montreal, plans improvements and extensions to shipyards at Three Rivers, Que., costing $236,000. J. M. Woodman is general superintendent.

Barrington, N. S., will build an electric lighting plant to cost $10,000. F. W. Homer, E. C. Hogg and Dr. H. D. Wilson are interested.

The North Shore Power Co., Power Building, Three Rivers, Que., plans installation of an electric lighting plant at St. Louis de Champlain, Que., to cost $10,000. W. B. Baptist is manager.

Plans are in progress for a $100,000 drydock and pile work costing $40,000 for the Tidewater Shipbuilders, Ltd., Three Rivers, Que. Mr. Mapes, care of the company, is engineer.

F. E. Partridge, Guelph, Ont., is interested in a company which will build a factory 80 x 200 ft. of reinforced concrete for the manufacture of rubber goods, etc.

The Canadian Iron Corporation, Fort William, Ont., is making preparations to remodel its pipe foundry at a cost of $125,000.

The McKenzie Machinery Co., Preston, Ont., is occupying the old Bronze Co. building and is rapidly getting the plant into shape. New machinery will be installed and an addition will be erected.

Whitman & Barnes, St. Catharines, Ont., are completing plans for the erection of a plant for the manufacture of farm implements. During the war the firm made munitions, but this work was carried out apart from their production of drills, wrenches, hammers, automobile fixtures, tools, etc.

Plans are being made by the McKinnon Industries, St. Catharines, Ont., for the manufacture of automobile transmissions, steering gears, radiators, etc., in addition to its regular production of malleable iron castings, hardware, drop forgings, iron and steel hames, electric welded products, etc.

The Fireless Cooker Co. of Canada, Ltd., Hull, Que., has been incorporated with a capital stock of $100,000 by Frank E. Ault, Arthur Ellis, both of Ottawa, Ont.; Arthur Ouellette, Hull, Que., and others, to take over the business now carried on by Alexander R. Macdonald, under the name of the Royal Fireless Cooker, and will manufacture fireless cookers, electrical appliances, etc.

Government Purchases

WASHINGTON, Feb. 24.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, for supplies for the naval service, as follows: Schedule 3732, for Charleston, S. C., one 36-in. throat convertible vertical single end punching machine, opening March 11; 3809, Alexandria, Va., parts to be finished and machined, opening March 25; 3810, for Puget Sound, 2 pipe machines, opening March 28; 3811, for Washington, 1 boring mill, opening March 28; 7801½, for Washington, 1 plate bending roll, opening Feb. 28; 7815½, for Mare Island, 1 motor generator set, opening March 7; 7818½, f.o.b. works, 1 cutter, reamer and drill grinder, opening March 7; 7819½, for Alexandria, Va., 6 bench lathes and 1 milling machine, opening March 7; 7821½, for Boston, one 15-ton trolley with one 5-ton auxiliary hoist, opening March 7.

NEW TRADE PUBLICATIONS

Air Compressors.—Sullivan Machinery Co., 122 South Michigan Avenue, Chicago. Four bulletins, No. 75-D describes a single stage, steam driven, straight line air compressor, built in capacities from 100 to 500 cu. ft. of free air per min. No. 75-E is devoted to a straight line, two-stage air compressor recently redesigned to embody the company's new plate type air valves, together with improvements in the steam valve gear and in the speed and pressure control. No. 75-G is concerned with a standard pattern, single stage compressor and a two-stage compressor, both belt driven. No. 75-I describes a motor-driven, portable air compressor mounted on a special truck for use chiefly underground in coal mines. Each bulletin shows views of the machine completely assembled, views of parts, and some typical installations.

Roller Bearings.—Timken Roller Bearing Co., Canton, Ohio. Booklet. Discusses the importance of anti-friction bearings, the places in a motor car where they are used and the functions they perform, also the right principles of their construction. Views of different types of motor car bearings are included.

Time Record System.—Gisholt Machine Co., Madison, Wis. Folder P. C. 3. Describes a time record system for scheduling and recording the starting and finishing time of each job.

Powdered Coal Transport System.—Quigley Furnace Specialties Co., 26 Cortlandt Street, New York. Bulletin No. 10 illustrates and describes a system for transporting and burning powdered fuel.

Sheet Metal Machine.—Long & Alstatter Co., Hamilton, Ohio. Booklet. Gives a cross-section view and an assembled view of a combined multiple punch, gate shear and trimming shear machine. This machine was described and illustrated in THE IRON AGE, issue of Jan. 23.

Boring Machine.—Universal Boring Machine Co., Hudson, Mass. Catalog. Devoted to a description of the company's universal (horizontal) boring machines. Numerous photographs of the machines at work, also views of the machines in the making, are included.

Grinders.—Charles H. Besly & Co., 118-124 North Clinton Street, Chicago. Catalog. Covers a complete line of disc and range wheel grinders and various accessories as used in connection with these machines. The different machines and accessories are illustrated and dimensions and specifications are included.

Electric Hot Plates, Stoves and Glue Pots.—American Electrical Heater Co., Detroit. Bulletins Nos. 3 and 4. The first describes an electric glue pot and the second, electric hot plates, disc stoves, and radiant burner stoves, designed for use in laboratories and other places where a heating surface of a large area is required. Views of the heaters are included.

Thread-cutting and Tapping Machinery.—Webster & Perks Tool Co., Springfield, Ohio. Catalog. A discussion with illustrations of the company's line of horizontal thread-cutting and special tapping machinery of the reversing type, also adjustable spring and adjustable solid thread-cutting dies.

Ovens and Furnaces.—Holcroft & Co., Detroit. Devoted to a line of open-hearth furnaces of various sizes and types, annealing furnaces used with oil, gas or coal; various types of malleable melting furnaces; non-ferrous melting furnaces, and core and mold ovens. Numerous views showing the different types of furnaces and ovens are given.

Drop Forgings.—Union Switch & Signal Co., Swissvale, Pa. Bulletin 91. Describes and illustrates the company's output of various types of drop forgings from open hearth, crucible, nickel, chrome, vanadium and other alloy steels.

Screws.—Victor Screw Works, Detroit. Booklet. Price lists and standard specifications of a line of cap screws, semi-finished nuts, lock washers, taper pins, Woodruff keys, machine screws, nuts and studs. A number of useful tables are included with the data so grouped in each table that the figures to be used by one department are not confused with the figures used by other departments. The book is designed for the use of purchasing agents, engineers, draftsmen and shop superintendents.

Pumping Machinery.—United Iron Works Co., Kansas City, Mo. Catalogue P-18. A description, with illustrations, of double stroke, deep well power pumps, ranging in capacity from 25 gal. to 2000 gal. per min. and for pressures up to 200 lb. per in. They are suitable for installation in deep or shallow wells, either drilled or dug, or in mine pits or shafts.

Surface Grinders.—The Blanchard Machine Co., 64 State Street, Boston. Pamphlet. Describes the company's No. 10 surface grinder, a smaller machine embodying the features of the Blanchard high power vertical surface grinder, known as the No. 16. The details are simplified where the smaller size and weight make it possible to simplify without reducing the efficiency. Specifications and a view of the machine are included.

Automatic Compensators.—Electric Controller & Mfg. Co., Cleveland. Bulletin 1042-B. Concerned with a compensator used for automatically starting squirrel-cage induction motors. The compensator is built in two standard sizes and is furnished for either 2-phase or 3-phase of 110, 220, 440 or 550 volts and for 25 and 60 cycles, or other frequencies if desired.

Dies and General Stampings.—Detroit Stamping Co., 951-957 W. Fort Street, Detroit. Folder. Lists the company's line of combination gang and round dies and general stampings.

Display Case Lighting.—National X-Ray Reflector Co., Chicago. Booklet. Describes the company's reflector designed primarily for show case lighting. The method of installation is explained and some illuminated show cases are illustrated.

Lift Truck.—Booklet. Barrett-Cravens Co., 77 Transportation Building, Chicago. Illustrates the use of its industrial lift truck in 20 different plant operations, and discusses at some length the handling of material with particular application to its apparatus. Different models are shown and their specifications. Views and drawings of a variety of racks for use in connection with the lift trucks are also given.

Roller Bearings.—Hyatt Roller Bearing Co., Newark, N. J. Bulletin No. 1815. Shows some typical designs and applications of the company's roller bearings to steel mill cars, roller tables and plate castors. Tables giving complete dimensions and load and speed data for steel mill roller bearings are included. This is a temporary bulletin issued until such time as the company's regular steel mill bulletin can be brought up to date and reprinted.

Rechargeable Dry Battery.—U-Need-It Dry Storage Battery Co., Inc., 115 Prince Street, New York. Folder. Describes a dry battery of the same size as the ordinary dry battery, capable of being recharged about 10 times. The capacity of the cell is 12 to 15 ampere hours, e.m.f. 1.7 volts.

Motor Compensator.—Electric Controller and Manufacturing Co., Cleveland. Pamphlet. Shows views and describes an automatic compensator for use in starting squirrel cage induction motors.

Pneumatic Hammer.—Titan Automatic Tool Co., 25 West Broadway, New York. Pamphlet. Describes a pneumatic hammer. The complete outfit consists of a hammer proper, an electric motor and a flexible shaft. The points of advantage claimed are simplicity and economy.

Mine Duty Self Starters.—Cutler-Hammer Manufacturing Co., Milwaukee. Leaflet. Illustrates and describes a sliding contact dashpot type and a pilot switch accelerator type of self starter for mine duty, designed to automatically insure the continuous running of pumps and fans.

Spacers.—Detroit Stamping Co., 951 West Fort Street, Detroit. Leaflet. Lists, illustrates and describes a stock of spacers for milling machine arbors.

Keg-Conveyor.—The Kent Machine Co., Kent, Ohio. Leaflet. Describes and shows how to use a conveyor for the moving of kegs. This "conveyor" was described in THE IRON AGE, issue of Dec. 5, 1918.

Cutters and Reamers.—Advance Tool Co., Cincinnati. A stock list which it is the purpose to issue monthly. Lists and illustrates the company's line of counterbores, slot and milling cutters, edge and end mills, gages, gage plugs, mandrels, reamers, collets, steel sleeves, collet and keyseat chucks.

Tonnage Conversion Charts.—Briggs & Turivas, Westminster Building, Chicago. Large cards. One is a tonnage card giving the equivalents in pounds of 1 to 1000 tons. Another gives the equivalents in pounds of tons up to 100, also the decimal parts of a ton of 2240 lb. Used in conjunction, the cards enable the quick determination of the number of pounds in any quantity up to 1000 tons.

Machine Guards.—Expanded Metal Engineering Co., 4 West Fortieth Street, N. Y. Booklet. Describes and illustrates various applications of the company's product, Steelcrete, an expanded metal cut from steel plate and pulled out into a fabric of diamond shaped mesh. Numerous illustrations showing specific applications of the mesh in machine guards are included.

Tool Steels.—McInnes Steel Co., Corry, Pa. Booklet. Describes the company's hammered crucible tool steels, including vanadium and chrome nickel steels made in various qualities.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is g... it being impossible to name every size.

The wholesale prices at which large lots are sol... manufacturers for direct shipment from mills ... given in the market reports appearing in a prece... part of THE IRON AGE under the general heading... "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	4.17c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Norway bars, base price	20.00c
Soft Steel:	
¾ to 17/8 in., round and square	3.97c
1 to 6 in. x ⅜ to 1 in.	3.97c
1 to 6 in. x ¼ and 5/16	4.07c
Rods—⅝ and 11/16	4.02c
Bands—1½ to 6 x 3/16 to No. 8	4.57c
Shapes:	
Beams and channels—3 to 15 in.	4.07c
Angles:	
3 in. x ¼ in. and larger	4.07c
3 in. x 3/16 and ⅛ in.	4.32c
1½ to 2½ in. x ⅛ in.	4.32c
1½ to 2¾ in. x 3/16 in. and thicker	4.07c
1 to 1¼ in. x 3/16 in.	4.12c
1 to 1¼ in. x ⅛ in.	4.17c
⅞ x ⅞ x ⅛ in.	4.22c
¾ x ⅛ in.	4.27c
⅝ x ⅛ in.	5.07c
½ x 3/32 in.	5.77c
Tees:	
1 x ⅛ in.	4.47c
1¼ in. x 1¼ in. x 3/16 in.	4.37c
1½ to 2½ x ¼ in.	4.17c
1½ to 2½ x 3/16 in.	4.17c
3 in. and larger	4.12c

Merchant Steel

	Per lb.
Bessemer machinery	3.97c
Tire, 1½ x ½ in. and larger	3.97c
Toe calk, ½ x ⅜ in. and larger	4.72c
Open-hearth spring steel	8.00c
Standard cast steel, base price	16.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	4.27c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	5.12c
No. 10	5.17c
No. 12	5.22c
No. 14	5.27c
No. 16	5.37c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.02c	—
Nos. 22 and 24	6.07c	7.62c
No. 26	6.12c	7.67c
No. 27	6.17c	—
No. 28	6.22c	7.82c
No. 29	6.32c	—
No. 30	6.42c	—

No. 28, 36 in. wide, 10c higher.

Genuine Russia, as per assortment ..... 22½ @ 25c

Patent planished, W. Dewees Wood.

A 13 to 13¼c; B 11 to 11¾c net

Galvanized

	Per lb.
No. 14	6.67c
No. 16	6.82c
Nos. 18 and 20	6.97c
Nos. 22 and 24	7.12c
No. 26	7.27c
No. 27	7.42c
No. 28	7.57c
No. 30	8.07c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Bright basic	5...
Annealed soft	5...
Galvanized annealed	6...
Coppered basic	6...
Tinned soft bessemer	7...

*Regular extras for lighter gages.

Brass Tubes, Rods and Wire, and Copper Tube

Manufacturers have withdrawn all quotations ... cause of unsettled prices of raw materials and will ... name prices to actual buyers.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 24½c. to 26½c. per ...

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over ... rolled.

Polished, 20 in. wide and under, 1c. per sq. ft. extra ... 20 in. wide, 2c. per sq. ft. extra.

Planished copper, 1c. per sq. ft. more than polished.

Tinning, one side, 6c. per sq. ft.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$11.65	$10.40
IX	13.85	12.35
IXX	15.60	14.10
IXXX	17.35	15.85
IXXXX	19.10	17.60

Coke—14x20	Primes	Was...
80 lb.	$8.70	$8...
90 lb.	8.80	8...
100 lb.	8.90	8...
IC	9.15	9...
IX	10.30	10...
IXX	11.45	11...
IXXX	12.60	12...
IXXXX	13.75	13...

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8...
IC	9...
IX	10...

Tin

Straits pig	74c to ...
Bar	85c to ...

Copper

Lake Ingot	20c to ...
Electrolytic	20c to ...
Casting	20c to ...

Spelter and Sheet Zinc

Western spelter	10c to ...
Sheet zinc, No. 9 base, casks	14c; open 14...

Lead and Solder*

American pig lead	6½ to ...
Bar lead	7½c to 8...
Solder ½ & ½ guaranteed	...
No. 1 solder	...
Refined solder	...

*Prices of solder indicated by private brand vary acc... ing to composition.

Babbitt Metal

Best grade, per lb	...
Commercial grade, per lb	...

Antimony

Asiatic	10c to ...

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting (carload lots), f.o.b. mill, per lb	33...
In small lots	38c to ...

Old Metals

The general tone of the market continues weak ... prices are lower. Dealers' buying prices are nomina... as follows:

	C... Pe...
Copper, heavy and crucible	1...
Copper, heavy and wire	1...
Copper, light and bottoms	1...
Brass, heavy	8...
Brass, light	6...
Heavy machine composition	1...
No. 1 yellow rod brass turnings	8...
No. 1 red brass or composition turnings	1...
Lead, heavy	4...
Lead, tea	4...
Zinc	4...